STAT 5145/6045
Statistical Computing
Fall 2025

Instructor:	Dr. Emily L. Kang		
Office:	4428B French Hall West	**Office Hours:**	T R 2:00 PM – 3:00 PM Office
Email:	kangel@ucmail.uc.edu		W 3:30 PM – 4:30 PM Zoom
When:	TR 12:30 PM – 1:50 PM		(or by appointment)
Where:	Room 4211 French Hall West		

Course Objective

This 3-credit course introduces the fundamentals of programming in R. Students will learn core programming concepts, including data structures, flow control, input/output, logical design, and basic statistical analyses. Emphasis is placed on developing maintainable code and producing reproducible results in numerical analyses and simulations. SAS will also be introduced briefly.

Assumed Background Knowledge

Students are expected to have prior exposure to statistical thinking, data analysis, and basic probability concepts. Although no previous programming experience is required, familiarity with using a computing system is assumed.

Textbooks

There is no required textbook for this course. The following are recommended as references:

- R for Data Science, by Hadley Wickham. `https://r4ds.had.co.nz/`

- R studio cheatsheets: `https://posit.co/resources/cheatsheets/`

- John Chambers, Software for Data Analysis: Programming with R, Springer, 2009

- SAS Online Manuals: `http://support.sas.com/documentation/onlinedoc/sas9doc.html`

- The Little SAS Book: A Primer, Sixth Edition `https://www.sas.com/storefront/aux/en/splsb/73044_excerpt.pdf`

Learning Outcomes

Upon successful completion of this course, students will be able to: Describe data both graphically and numerically using statistical software; Apply basic exploratory data analysis methods and computational techniques for simple statistical analyses.

Software

`R` and `SAS` (`http://www.uc.edu/ucit/ware/software/sas.html`) are used in this course. Template code, datasets, and other resources will be posted on Canvas.
`R` is free to download. You will also need to download and install RStudio and Quarto.
We will use SAS OnDemand for Academics, which is free and accessible online: `https://www.sas.com/en_us/software/on-demand-for-academics.html`. Please be aware of the scheduled maintenance times of SAS OnDemand, during which the system is unavailable. Assignment due dates will

not be adjusted solely because of SAS OnDemand maintenance.

Course Format
Instead of holding regular lectures during every scheduled class session, the course will be structured as follows:

- The instructor will deliver lectures during the first hour (approximately).

- The final 20 minutes will be reserved for open lab work. During this time, students are expected to use their personal computers to practice code from the lectures and/or work on lab problems.

- Beginning in Week 2, a weekly lab assignment will be announced and posted on Canvas each Monday. Labs will be due by 9:00 PM Eastern Time on Friday. All submissions must be in PDF format and uploaded via Gradescope. **Handwritten reports or images of lab work will not be accepted. Students must use Quarto to prepare their reports, which should include both code and output.**

If circumstances require a shift to online or remote learning during the semester, the transition can be made smoothly with minimal disruption and Lecture recordings made available on Canvas.

Lab
Labs will be assigned and announced on Canvas throughout the semester. All code used to produce your results must be included in your submission. **Handwritten reports or images of lab/exam work will not be accepted. Students must use Quarto to generate their reports, which should contain both code and output.**
Lab submissions must be uploaded in PDF format to Gradescope by the posted due date and time. This is the only acceptable submission method – do not email your work. Only your most recent Gradescope submission will be graded.
Late submissions will not be accepted, except in extreme and documentable circumstances approved by the instructor. Please note that knitting/rendering errors or technical difficulties on your end will not be grounds for an extension. *At the end of the semester, your lowest lab score will be dropped from final grade calculation.*
Collaboration is encouraged when discussing course materials with classmates; however, the work you submit, including both code and explanations, must be your own. Copying from other students or external sources will not help you learn programming and may have serious consequences. Academic misconduct **will not** be tolerated (`https://www.uc.edu/campus-life/conduct/academic-integrity.html`).

Exams
There will be **two exams** during the semester; no comprehensive final exam will be given. Students may be required to bring their personal computers to complete the exams during class and submit their work via Gradescope at the end of the exam period. Detailed instructions and requirements for each exam will be announced in advance, both in class and on Canvas.

Final Grade
Your final course grade will be determined using the following weighting:

- Class participation (attendance, pop quizzes, in-class discussions): 15%

- Exam 1: 25%

- Exam 2: 25%

- Labs: 35%

Your final course letter grade will be assigned according to the following grading scale:

		B+	87 – 89	C+	77 – 79	D+	67 – 69		
A	93 – 100	B	83 – 86	C	73 – 76	D	63 – 66		
A-	90 – 92	B-	80 – 82	C-	70 – 72	D-	60 – 62	F	below 60

Attendance
Beginning Fall 2016, Title IV provisions require undergraduate students to demonstrate participation in each course in order to remain eligible for federal financial aid. To meet this requirement, the University and the College of Arts & Sciences have implemented a simple procedure through Canvas. When you access the Canvas site for each of your courses, you will see a link in the left-hand control panel titled "Attendance Verification." Clicking this link will take you to a short question. Submitting your response will serve as verification of your participation.

Email Correspondence
The best way to contact the instructor is via email at `kangel@ucmail.uc.edu`. All course-related email communication must be conducted through your UC email account or Canvas. The instructor will not send messages to external accounts (e.g., Gmail).

Communication Devices
Personal communication devices (e.g., cell phones) must be **turned off or set to vibrate** during class. Please refrain from texting or using devices in a way that disrupts class.

Virtual Office Hours
In addition to in-person office hours, the instructor will hold virtual office hours via Zoom. Students may reserve a time slot by going to *Canvas → Calendar → Find an Appointment*.

Campus Safety Measures
All faculty, staff, instructors, and students are required to follow campus safety measures, which can be found here: https://www.uc.edu/about/publicsafety.html.

Academic Integrity
Please help maintain an academic environment of mutual respect and fairness. You are expected to produce original and independent work on exams. For homework, discussion is encouraged; however, copying someone else's work and presenting it as your own constitutes plagiarism. All students must submit their own written work in their own words. Academic misconduct **will not** be tolerated. For more information, see: `https://www.artsci.uc.edu/student-experience/academic-forms-and-policies/misconduct-process.html`.

Accessibility Resources
Reasonable accommodations will be provided for students with documented needs. To access these accommodations, students must contact Accessibility Resources as described on their website: `https://www.uc.edu/campus-life/accessibility-resources.html`.

Religious Accommodations
Ohio law and the University's Student Religious Accommodations for Courses Policy 1.3.7 permits a

student, upon request, to be absent for reasons of faith or religious or spiritual belief system or participate in organized activities conducted under the auspices of a religious denomination, church, or other religious or spiritual organization and/or to receive alternative accommodations with regard to examinations and other course requirements due to an absence permitted for the above-described reasons. Not later than fourteen days after the first day of instruction in the course, a student should provide the instructor with written notice of the specific dates for which the student requests alternative accommodations. University policy can be found at: `https://www.uc.edu/about/equity-inclusion/equal-opportunity/student-religious-accommodations-for-courses-policy.html`. Additional information about or questions related to the policy can be directed to the Office of Equal Opportunity (OEO).

Drop and Withdraw Dates
The last day to drop without entry to the academic record is Monday, September 8, 2025. The last day to withdraw is Friday, November 21, 2025.

Holidays
There will be no class on the following days:
Labor Day: Monday, September 1, 2025
Reading Days: Thursday, October 9 – Friday, October 10, 2025
Veteran's Day: Tuesday, November 11, 2025
Thanksgiving Weekend: Thursday, November 27 – Sunday, November 30, 2025

Receiving an 'I' for the course:
You cannot receive receive an incomplete for the course unless 70% of the work in the course (especially the attendance) has been completed. Extenuating circumstances will be handled on a case-by-case basis.

Topics:

- Basics of R programming

  - Data structures
  - Control flow
  - Functions
  - Slightly more advanced topics

- Plotting in R

- Simulations

- Optimization (basic)

- Statistical learning (basic)

- Basic of SAS programming

- Reproducible research, Git/Github, cloud computing

Note: The instructor reserves the right to change the class syllabus to meet class needs.

STAT : _____

I read the entire course syllabus thoroughly and will obey the policies for this course through the semester.

Name (Last, First): _____

Major: _____

Math/Stat Courses taken previously:

Signature: _____

Date: _____