

STAT 540: Computing in Statistics
Fall 2026

MW 14:20- 15:35PM, LeConte 103

Instructor: Yen-Yi Ho

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Credit Hours: 3

Class Website: <https://people.stat.sc.edu/hoyen/STAT540/Stat540.html>

Class Meeting Times: MW 14:20- 15:35PM, LeConte 103

Office Hours: Th 16:30– 17:30 PM, Friday 11:00 AM -12:00PM or by appointment.

Teaching Assistant: Alex Goebel (AJGOEBEL@email.sc.edu).

TA Office Hours: Tuesday at 12PM -1 PM, Thursday at 12PM - 1 PM (LeConte 219A) or Virtual (please email TA for the link).

Textbook and required material:

1. *Basics of R: A Primer* by Don Edwards (Available on course website).
2. *The Little SAS book: A Primer*, 6th edition, by Delwiche and Slaughter.
3. *Introduction to Data Science: Data Wrangling and Visualization with R*, by Rafael A. Irizarry (link on course website).
4. *Python Data Science Handbook* by Jake VanderPlas (Required) (link on course website).

Recommend to read *Introduction to R*, available at CRAN: <http://www.r-project.org> (click “manuals” under “documentation” at left side of page; then choose the first manual, “introduction to R”).

Disabilities:

If you qualify for accommodations because of a disability, please submit a letter to me from the Student Disability Resource Center in a timely manner so that your needs can be addressed. The Student Disability Resource Center determines accommodations based on documented disabilities. Contact: 777-6741, Close-Hipp 102, sadrc@mailbox.sc.edu (sc.edu/about/offices_and_divisions/student_disability_resource_center/)

Learning Outcomes:

Successful students in this course will learn computing skills that will be useful to them both in academic endeavors and as working statisticians. Specifically, successful students at the end of class should be able to

1. Identify different types of objects in R, Python and understand their uses
2. Carry out arithmetic and logical operations in R, Python
3. Manage datasets in R, Python and SAS, including data sorting and subsetting

4. Input, output, and save datasets in R, Python and SAS
5. Produce high-quality graphics in R, Python

Course Content:

Selected chapters in Introduction to Data Science by Rafael Irizarry, Basic of R by Don Edwards, Python Data Science Handbook by Jake VanderPlas and the Little SAS book by the Delwiche and Slaughter textbooks.

Topics to be covered include: Objects in R; Inputting and outputting Data in R; R commands for Graphics, Functions, Arithmetic, Logicals, Conditional Execution, Subsetting, Sorting, and Iteration; Random variable generations and simulations; R functions of root finding, optimization, and integration. Introduction to SAS; Reading and Writing Data; Working with Your Data; Sorting, Printing, Summarizing Data; Modifying and Combining Data Sets; Data visualizing techniques; Basic statistics procedures.

Required computing recourses

Access to a computer (64-bit operating system) with R (available as a free download from the CRAN home page), **R Studio and Python/Anaconda**. Notice that a Chromebook will not have sufficient computing power required by this course.

In addition, access to SAS (free access of SAS using SAS Studio; students who want their own SAS can buy a student copy from USC IT Services) is also required. Notice that a Chromebook will not have sufficient computing power required by this course. It is encouraged to bring your own laptop to the class and practice along with the programming code during the class.

To participate in learning activities and complete assignments, you will need:

- This course involves hand-on data analysis during the class section. It is encouraged that students bring a laptop during class sections.
- Access to a working computer that has a current operating system with updates installed;
- RStudio program and report writing using R Markdown installed;
- Jupyter and Python/Anaconda, and
- Reliable Internet access and a USC email account;
- A current Internet browser that is compatible with Blackboard (Google Chrome is the recommended browser for Blackboard);
- Reliable data storage for your work, such as a USB drive or Office365 OneDrive cloud storage.

If your computer does not have RStudio or Jupyter program. It is free and can be downloaded from <https://posit.co/download/rstudio-desktop/> and <https://www.anaconda.com/download>. If you have further questions or need help with the software, please contact the Service Desk (https://www.sc.edu/about/offices_and_divisions/university_technology_services/support/servicedesk.php)

Details on Graded Assignments:

Homework (40%): There are weekly homework assignments for this course, and they will be posted on the course website. **Late homework will lose 10% of total points per day. Compile your homework as a webpage (html). Then open it in a browser and print it to a .pdf file. Upload this pdf file and the .qmd or .ipynb file to blackboard.**

One take-home mid-term exam (30%) will be assigned. One week is allowed to complete each exam. The mid-term exam will be assigned on **October 7th** tentatively.

Final Project (30%): The instruction for the final project will be posted on the course website. Each student will have time to present the final project during class time. The written report will be due by **Friday December 11, 2026 before 5PM**. No late final project report will be accepted.

Grading Components		Grading Scale			
Homework	40%	A	90-100%	C	70-76.9%
Midterm	30%	B+	87-89.9%	D+	67-69.9%
Final Project	30%	B	80-86.9%	D	60-66.9%
Total	100%	C+	77-79.9%	F	Less than 60%

Excused Absences and How to Report an Illness:

All absences due to documented illness or quarantine will be excused, and no grade penalty will be assessed for missing classes for this reason. If you experience COVID-19 symptoms, please stay home, contact the COVID-19 Student Health Services (SHS) nurse line (803-576-8511), complete the COVID-19 Student Report Form (go.sc.edu/covidstudentreport), and select the option allowing the Student Ombuds to contact your professors. When talking with the SHS nurse, be sure to ask for documentation of the consult as you will need this to document why

you missed class. You will also use the COVID-19 Student Report Form if you have tested positive for COVID-19 or if you have been ordered to quarantine because of close contact with a person who was COVID-19 positive. In each of these situations you will be provided appropriate documentation that can be shared through the Student Report Form.

Student Well-Being:

Any student who has difficulty affording groceries or accessing sufficient food to eat every day, or who lacks a safe and stable place to live and believes this may affect their performance in the course, is urged to contact the Division of Student Affairs and Academic Support. If you are comfortable doing so, please notify me as the professor so that we can find resources that may be helpful.

Students do not learn when they do not feel safe. If you feel unsafe on campus at any time in any place, please contact Police Dispatch at 803-777-4215 (in an emergency, please call 911 and reach out to the Division of Student Affairs and Academic Support. Again, if you are comfortable doing so, please notify me as the professor, and I will do my best to make appropriate accommodations.

Students may experience situations or challenges that can interfere with learning and inter-personal functioning including stress, anxiety, depression, substance use, concern for a family/friend, or feelings of hopelessness. Pay attention to what is happening in the classroom and in the lives of your fellow students. There are numerous campus resources available to students including University Counseling Psychiatry Service and University Student Health Services. Help is available 24/7. Students who need immediate help should call 803-777-5223. An outside resource is the National Suicide Prevention Lifeline (800-273-8255).

Expectations

- Attend the class at the scheduled times and ask questions when getting lost.
- It is fine to discuss homework and class assignments with your classmates and me, but all such assignments must be coded or written independently.
- Do not copy any part of homework, exam work, or computer codes from any other students.
- You are not allowed to discuss take-home exams with your classmates; please consult me if you have any questions.

Course Policies and Procedures

- Please hand in a hard copy of your Homework and R code in class and also email your R code to TBA.
- I encourage you to work together in computing and discussing the problems. However, each student is expected to independently write up the submitted assignment using her or his own computing and giving explanations in her or

his own words.

- Late homework will lose 10% of total points per day, unless arrangements have been made with the instructor for an extension. Homework will not be accepted after the time at which graded homework are returned.
- Incomplete Contracts: A grade of incomplete "I" shall be assigned at the discretion of the instructor when, due to extraordinary circumstances (e.g., documented illness or hospitalization, death in family, etc.), the student was prevented from completing the work of the course on time. The assignment of an "I" requires that a contract be initiated and completed by the student before the last official day of class, and signed by both the student and instructor. If an incomplete is deemed appropriate by the instructor, the student in consultation with the instructor, will specify the time and manner in which the student will complete course requirements. Extension for completion of the work will not exceed one year (or earlier if designated by the student's college).

Attendance Policy

When you miss class, you miss important information. If you are absent, you are responsible for learning material covered in class. If you are absent when an assignment is due, you must have submitted the assignment prior to the due date to receive credit. If you miss more than 20% of the classes unexcused, your grade will be dropped one letter grade.

Academic Integrity

You are expected to practice the highest possible standards of academic integrity. Any deviation from this expectation will result in a minimum academic penalty of your failing the assignment and will result in additional disciplinary measures. This includes improper citation of sources, using another student's work, and any other form of academic misrepresentation.

The first tenet of the Carolinian Creed is, "I will practice personal and academic integrity."

Below are some websites for you to visit to learn more about University policies:

Carolinian Creed (<http://www.sa.sc.edu/creed>)

Academic Responsibility (<http://www.sc.edu/policies/staf625.pdf>)

Office of Student Conduct and Academic Integrity
(<https://www.sa.sc.edu/academicintegrity/>)

Network Guidelines for Responsible Computing

(http://www.sc.edu/about/offices_and_divisions/university_technology_services/policies_procedures/networkguideline.php)

Plagiarism

Using the words or ideas of another as if they were one's own is a serious form of academic dishonesty. If another person's complete sentence, syntax, key words, or

the specific or unique ideas and information are used, one must give that person credit through proper citation.

Class Conduct

Professionalism will be expected at all times. Because the university classroom is a place designed for the free exchange of ideas, we must show respect for one another in all circumstances. We will show respect for one another by exhibiting patience and courtesy in our exchanges. Appropriate language and restraint from verbal attacks upon those whose perspectives differ from your own is a minimum requirement. Courtesy and kindness is the norm for those who participate in my class.

Instructional Methods

The course will be taught using multiple instructional methods. These methods will include lecture, computer programming exercise sections.

Diversity and Inclusion

The university is committed to a campus environment that is inclusive, safe, and respectful for all persons, and one that fully embraces the Carolinian Creed. To that end, all course activities will be conducted in an atmosphere of friendly participation and interaction among colleagues, recognizing and appreciating the unique experiences, background, and point of view each student brings. You are expected at all times to apply the highest academic standards to this course and to treat others with dignity and respect.

Expectations of the Instructor

I am expected to facilitate learning, answer questions appropriately, be fair and objective in grading, provide timely and useful feedback on assignments, maintain adequate office hours, and treat you as I would like to be treated.

Course Communication

I will be communicating with you regarding grades and assignments. If you need to get in touch with me, the best method is via email.

If you are having trouble with this course or its material, you should contact me via email to set up an appointment to discuss the issues.

Emails will be sent your email address. In addition, announcements may be posted on the course website. If you primarily use another email account, you should make sure that the Blackboard account is linked to that address. It is your responsibility to ensure that your email account works properly in order to receive mail.

Please be sure that the email you check regularly is set in Blackboard:

- Click on the My USC tab along the top of the page in Blackboard
- In the Tools module, click on "Personal Information"

- Click on "Edit Personal Information"
- Scroll down to the listing for Email
- In the box will be listed what Blackboard has as your email address. If you wish to change it, delete the email address in the box and type in the email address you want to use.
- Click on the Submit button at the top or bottom of the page.

Disability Services

Student Disability Resource Center (<http://www.sa.sc.edu/sds/>): The Student Disability Resource Center (SDRC) empowers students to manage challenges and limitations imposed by disabilities.

Student Success Center

In partnership with USC faculty, the Student Success Center (SSC) offers a number of programs to assist you in better understanding your course material and to aid you on your path to success. SSC programs are facilitated by professional staff, graduate students, and trained undergraduate peer leaders who have previously excelled in their courses. Resources available to you in this course may include:

- Peer Tutoring: You can make a one-on-one appointment with a Peer Tutor (www.sc.edu/success). Drop-in Tutoring and Online Tutoring may also be available for this course. Visit their website for a full schedule of times, locations, and courses.
- Supplemental Instruction (SI): SI Leaders are assigned to specific sections of courses and hold three weekly study sessions. Sessions focus on the most difficult content being covered in class. The SI Session schedule is posted through the SSC website each week and will also be communicated in class by the SI Leader.
- Peer Writing: Improve your college-level writing skills by bringing writing assignments from any of your classes to a Peer Writing Tutor. Similar to Tutoring, you can visit the website to make an appointment, and to view the full schedule of available drop-in hours and locations.
- Success Consultations: In Success Consultations, SSC staff assist you in developing study skills, setting goals, and connecting to a variety of campus resources. Throughout the semester, I may communicate with the SSC via Success Connect, an online referral system, regarding your progress in the course. If contacted by the SSC, please schedule a Success Consultation.

Success Connect referrals are not punitive and any information shared by me is confidential and subject to FERPA regulations.

SSC services are offered to all USC undergraduates at no additional cost. You are invited to call the Student Success Hotline at (803) 777-1000, visit the SSC website (www.sc.edu/success), or stop by the SSC in the Thomas Cooper Library on the Mezzanine Level to check schedules and make appointments.

Writing Center

Writing Center (<http://artsandsciences.sc.edu/write/university-writing-center>)

This course has many of writing assignments. The University Writing Center is an important resource you should use! It's open to help any USC student needing assistance with a writing project at any stage of development. The main Writing Center is in Byrnes 703.

Library Resources

Library Resources (<http://library.sc.edu>)

The university library has great resources for finding out how to cite materials in your projects. Remember that if you use anything that is not your own writing or media (quotes from books, articles, interviews, websites, movies – everything) you must cite the source in MLA format.

Blackboard and Technology

(http://www.sc.edu/about/offices_and_divisions/university_technology_services/)

As a student in this course, you have access to support from the Division of Information Technology (DoIT) for Blackboard and computer issues. The service desk can be reached at 803-777-1800.

Counseling Services

(https://sc.edu/about/offices_and_divisions/student_health_services/medical-services/counseling-and-psychiatry/index.php): The University offers counseling and crisis services as well as outreach services, self-help, and frequently asked questions.

Copyright and Fair Use

Course readings, lecture slides, recordings, datasets, code examples, software documentation, assignment materials, and other resources may be protected by copyright or subject to license restrictions. Some materials are made available for educational purposes under the doctrine of fair use or through licenses held by the University.

Students may download or reproduce course materials as reasonably necessary for their personal study and completion of course requirements. Unless the copyright holder, license, or instructor expressly permits otherwise, students may not post, publish, sell, upload, or distribute course materials, assignment prompts, solution code, recordings, or another person's work. This restriction includes posting

materials to public websites, repositories, file-sharing services, or generative artificial intelligence systems.

When incorporating code, text, graphics, datasets, or other materials created by someone else, students must provide appropriate attribution and comply with any applicable copyright, open-source license, data-use agreement, or terms of service. Materials carrying an explicit open license may be reused only according to that license. An educational purpose does not automatically make every use permissible.

Use of Generative Artificial Intelligence

Generative artificial intelligence tools can support learning, but they cannot replace the individual practice required to become proficient in statistical reasoning, programming, debugging, interpretation, and reproducible analysis. This policy applies to chatbots, generative code-completion systems, AI features built into programming environments, and other tools that generate or substantially rewrite code, prose, analyses, or answers.

Default course rule. Unless an assignment states otherwise, limited use of generative AI is permitted on homework and projects only as described below and only when the use is disclosed. Generative AI is prohibited on quizzes, examinations, individual proficiency assessments. Instructions provided for a particular assessment take precedence over this general policy.

Permitted uses. On assignments for which AI use is allowed, students may use it to:

- Request explanations of statistical or programming concepts.
- Ask for clarification of an error message.
- Obtain debugging suggestions for code the student has already written.
- Generate small practice examples or test cases.
- Compare possible ways to organize, document, or improve code.
- Receive feedback on the clarity of an explanation written by the student.

Prohibited uses. Unless the instructor explicitly authorizes them, students may not:

- Ask an AI system to complete an assignment or generate substantially all of a solution.
- Submit AI-generated code, output, interpretations, visualizations, or written explanations as though they were created independently.
- use AI to translate a complete solution from R to Python, Python to SAS, or any other language when the translation effectively supplies the required solution.
- Use AI during a quiz, examination, or other restricted assessment.
- Fabricate data, program output, citations, package documentation, or results.

- Upload answer keys, restricted course materials, proprietary datasets, confidential information, personally identifiable information, or another person's work to an AI system.
- Rely on generated code or statistical advice without independently testing and verifying it.

Generative inline code suggestions count as AI assistance. Ordinary syntax highlighting, spell-checking, and deterministic autocomplete that merely complete known commands are not considered generative AI under this policy.

Verification and responsibility. You are responsible for everything you submit, regardless of how it was produced. Before submission, you must run the code yourself, confirm that it works with the required data and software, verify relevant functions and statistical assumptions using authoritative documentation, and ensure that the results support your interpretation. Submitted work must be reproducible from the code and files provided. You must also be prepared to explain your code, methodological choices, and results without assistance. Explanation or reproducing part of a submitted analysis might be requested. Failure to disclose AI assistance, use of AI on a prohibited assessment, or submission of generated work that does not represent the student's own understanding may be treated as an academic-integrity violation.