

STOR 455, SECTION 1, SPRING 2021
METHODS OF DATA ANALYSIS
Instructor: Richard L. Smith (Updated February 5 2021)

Time of Class: This course is on Mondays, Wednesdays and Fridays, 12:20-1:10 pm. The first class is on Wednesday, January 20, and the last class is on Wednesday, May 5. There will be no class on Monday February 15 (Wellness Day), Friday March 12 (Wellness Day), Friday April 2 (State Holiday) or Monday April 5 (Wellness Day). The final exam has been set for Saturday, May 8, 12:00-3:00 pm.

Location: This is an online class. All class sessions will take place by zoom. To access zoom: **Please email Richard Smith if you would like to be added to the zoom meetings.**

Instructor: Richard L. Smith, rls "at" email "dot" unc "dot" edu

Office hours (tentative): Tuesdays (online only) 10:30-11:30; Wednesdays (online only) 11:00-12:00. These office hours may be changed after consultation with the class and after my own schedule is more definite; updates will be posted here and announced directly to the class. Instructions for joining an online office hours will be posted on the course sakai page after the course begins. In addition, I expect to be able to remain online for at least 10-15 minutes after each class to answer in-person students' questions.

Instructional Assistant: Haixu Ma, haixuma "at" live "dot" unc "dot" edu

Haixu Ma's office hour: Mondays 2:00-3:00. Zoom link:
<https://us02web.zoom.us/j/6291420269?pwd=WW5KRjk4RkpNL2dBRzZXTXFiclF3dz09>
Meeting Number: 629 142 0269, Password: STOR455

Grader: Hank Flury, haixuma "at" live "dot" unc "dot" edu

Class Policies. This is a "synchronous remote" class (<https://carolinatogether.unc.edu/in-person-and-remote-instruction/>). Attendance, at the designated times, will be expected and is a requirement of class registration. However, it is also my plan to record every class and to post the recordings on zoom or Panopto (details to be given later). If you do (occasionally) miss a class, you can make up for it by viewing the recording. I also encourage all students to view the recordings if and when they need to revise the material. I will be keeping track of attendance for administrative purposes, and students who do not attend regularly may receive a warning. In addition, I would like to remind everyone of a few "dos and don'ts" about zoom meetings: see <http://rls.sites.oasis.unc.edu/ZoomMeetingCodeOfConduct.pdf>. If you have questions about the arrangements for the course, please email the instructor.

Course URL: Visit <https://sakai.unc.edu/> and login with your Onyen.

Description: This course presents regression analysis and other data modeling techniques, and is recommended for students throughout the natural and social sciences who are interested in applying

regression analysis in their research and/or understanding the underlying statistical principles. The topics include simple and multiple linear regression, matrix representation of the regression model, statistical inferences for the regression model, diagnostics, outliers and influential cases, polynomial regression and interaction regression models, model selection, and the ANOVA model and test. If time permits, we will address other important topics as well. Statistical software R will be used throughout the course to demonstrate how to apply the techniques on real data. The main objective of this course is for students to gain an appreciation of how to use regression methods properly in data analysis and to master implementation of these techniques in a computing environment.

Materials and Websites for the Class:

Textbook: Graybill and Iyer, REGRESSION ANALYSIS: Concepts and Applications. Available for free at http://www.stat.colostate.edu/%7Ehari/regression_book/index.html

There is be a tab for the textbook on Sakai, and other materials will also be provided during the course.

Gradescope: All homework will be handed in on Gradescope, which you can access through the Gradescope tab on sakai.

Piazza: Piazza is a forum where students can ask questions of me and each other and get responses in a timely fashion. I have not previously used it myself, but several colleagues (including Dr. Cunningham, who is teaching the parallel STOR 455.2) have used it and highly recommend it. However, Piazza is moving to a for-payment model with a more limited free option. I need to find out what other people are doing before making a firm decision myself. I will get back to you once I have a recommendation how to proceed.

Programming Requirement: Throughout the course, we will be taking advantage of the R programming language. Before the course, you should download R, R-studio and R-markdown, all of which are free. If needed, I will provide further references for use of R.

Prerequisites: STOR 155 or equivalent. Some familiarity with matrix algebra is recommended, but not required.

Final Grade: 30% HW, including Case Studies and Projects; 25% midterm 1, 25% midterm 2; 20% final exam at noon on **Saturday**, May 8.

Pass-Fail Option: Similar to Fall 2020. Students have the option of switching to P/F grading if you file the registrar's office form by **Wednesday, May 5**.

HW Assignments:

Homework due dates will be made clear throughout the course. In general, there will always be some problems to be working on although the due dates will vary. Please watch for class announcements for more details of the homework schedule. Every assignment will be posted on Gradescope at least one week before the assignment is due.

- On homework, it is ok to work with others, but the work you turn in should be yours alone. Do not copy-paste code from other students, this is easily detected and defeats the purpose of the homework.

- The most important rule for homework (or life) is to give attribution when you use someone else's work. Just give them credit. Then there is no way to get into an awkward situation.

Midterm Exams

There will be two midterm exams, tentatively scheduled for Monday, February 22 and Monday, March 29. **If you have a conflict on either of those dates, please let me know as soon as you become aware of the conflict.** Both midterm and final exams are open book: you can use the course text, personal notes, and any other resources that have been made available in the course. Also, you will be allowed to use R and to consult regular R resources (e.g. help commands) during the exam. However, you cannot consult with other sources (or other people!) while the exam is in progress. **Tentatively, I plan to leave the exam open for 24 hours but you will be required to complete the exam within 2 hours of starting it.** In other words, it's a 2-hour exam but you can choose which 2 hours you spend on it, within the 24 hours that the exam is open. The exact period during which the exam is open and any further changes in format will be posted nearer the date of the exam.

Accessibility Resources

The University of North Carolina at Chapel Hill facilitates the implementation of reasonable accommodations, including resources and services, for students with disabilities, chronic medical conditions, a temporary disability or pregnancy complications resulting in barriers to fully accessing University courses, programs and activities.

Accommodations are determined through the Office of Accessibility Resources and Service (ARS) for individuals with documented qualifying disabilities in accordance with applicable state and federal laws. See the ARS Website for contact information: <https://ars.unc.edu> or email ars@unc.edu. (source: <https://ars.unc.edu/faculty-staff/syllabus-statement>)

Counseling and Psychological Services (CAPS)

CAPS is strongly committed to addressing the mental health needs of a diverse student body through timely access to consultation and connection to clinically appropriate services, whether for short or long-term needs. Go to their website: <https://caps.unc.edu/> or visit their facilities on the third floor of the Campus Health Services building for a walk-in evaluation to learn more. (source: Student Safety and Wellness Proposal for EPC, Sep 2018)

Title IX Resources

Any student who is impacted by discrimination, harassment, interpersonal (relationship) violence, sexual violence, sexual exploitation, or stalking is encouraged to seek resources on campus or in the community. Please contact the Director of Title IX Compliance (Adrienne Allison – Adrienne.allison@unc.edu), Report and Response Coordinators in the Equal Opportunity and Compliance Office (reportandresponse@unc.edu), Counseling and Psychological Services (confidential), or the Gender Violence Services Coordinators (gvsc@unc.edu; confidential) to discuss your specific needs. Additional resources are available at safe.unc.edu.

Honor Code: (For the complete honor code, please visit <http://instrument.unc.edu/>)

It shall be the responsibility of every student enrolled at the University of North Carolina to support the principles of academic integrity and to refrain from all forms of academic dishonesty, including but not limited to, the following:

1. Plagiarism in the form of deliberate or reckless representation of another's words, thoughts, or ideas as one's own without attribution in connection with submission of academic work, whether graded or otherwise.
2. Falsification, fabrication, or misrepresentation of data, other information, or citations in connection with an academic assignment, whether graded or otherwise.
3. Unauthorized assistance or unauthorized collaboration in connection with academic work, whether graded or otherwise.
4. Cheating on examinations or other academic assignments, whether graded or otherwise, including but not limited to the following:
 - (a) Using unauthorized materials and methods (notes, books, electronic information, telephonic or other forms of electronic communication, or other sources or methods);
 - (b) Violating or subverting requirements governing administration of examinations or other academic assignments;
 - (c) Compromising the security of examinations or academic assignments;
 - (d) Representing another's work as one's own; or
 - (e) Engaging in other actions that compromise the integrity of the grading or evaluation process.
5. Deliberately furnishing false information to members of the University community in connection with their efforts to prevent, investigate, or enforce University requirements regarding academic dishonesty.
6. Forging, falsifying, or misusing University documents, records, identification cards, computers, or other resources so as to violate requirements regarding academic dishonesty.
7. Violating other University policies that are designed to assure that academic work conforms to requirements relating to academic integrity.
8. Assisting or aiding another to engage in acts of academic dishonesty prohibited in the above items.

Administrative details

- All questions regarding course registration and waiting list should be directed at Ms. Christine Keat, crikeat@email.unc.edu.
- The instructor reserves the right to make changes to the syllabus.