Syllabus

STAT 5732

Introduction to R for Data Science II: Intermediate R

- Spring 2026 (03/04 – 04/27)
- 1 Credit Hour
- Online

Course overview

Instructor

- Jillian Morrison, PhD in Statistical Science
- Office: Cockins Hall 329
- Email: morrison.1043@osu.edu

- Office hours on Zoom on Tuesday 12:00pm-1:00pm
    - Scheduling information and meeting links on Carmen

Note: My preferred method of contact is email.

Graders and Teaching Assistants

- Jongha Lee, Email: Lee.10895@buckeyemail.osu.edu
- Kiljae Lee, Email: Lee.10428@osu.edu

- Office hours are available on upon request.

Note: Their preferred method of contact is email.

Course Description

R is a freely available statistical computing environment and programming language. It has become a dominant workhorse for modern statistical research and data analysis and has been widely adopted in industrial data analytics as well. This course is part of a sequence whose goal is to teach students how to use R effectively for doing data science – importing raw data and transforming it into insights and knowledge that can be communicated with others. Throughout the sequence, there will be an emphasis on coding practices for ensuring reliability, reproducibility, and transparency of data analyses. Part I of the sequence introduces the basic workflow and focuses on basic usage of important tools in R for visualization, transformation, and organization of data.

Course expected learning outcomes

By the end of this course, students should successfully be able to:

1. Understand and work with basic R data types (e.g., logicals, numbers, factors).
2. Work with dates and times and understand fundamental issues such as time zones and durations (e.g., one month is not always 30 days).
3. Join multiple data frames.
4. Program in R with functions, conditional execution, and iteration.

Prerequisites

STAT 1350, 1350.01, 1350.02, 1430, 1430.01, 1430.02, 1450, 1450.01, 1450.02, 1550, 2450, 2450.01, 2450.02, 2480, 2480.01, 2480.02, 3201, 3202, 3450, 3450.01, 3450.02, 3460, 3470, 3470.01, 3470.02, 4202, 5301, or 5302, or equiv., or graduate standing, or permission of instructor. Not open to students with credit for STAT 5730.

How this online course works

Mode of delivery

This course is 100% online. There are no required sessions when you must be logged in to Carmen at a scheduled time. I will send all important class-wide messages through the Announcements tool in Carmen. Please check your notification preferences to ensure you receive these messages.

Pace of online activities

This course is divided into five modules, consisting of short video lectures and assignments, that are generally released at the beginning of each week. Students are expected to keep pace with weekly deadlines but may schedule their efforts freely within that time frame.

Credit hours and work expectations

This is a 6-week, 1-credit-hour course. According to Ohio State policy, students should expect around 2 hours per week of time spent on direct instruction (instructor content and Carmen activities, for example) in addition to 4 hours of homework (reading and assignment preparation, for example) to receive a grade of at least (C) average.

Participation requirements

Because this is an online course, your attendance is based on your online activity and participation. The following is a summary of students' expected participation:

Participating in online activities

You are expected to log in to the course in Carmen every week. Online activities also include watching prerecorded lecture videos and posting in Carmen discussion forums, including a weekly discussion assignment. During most weeks you will probably log in many times. If you have a situation that might cause you to miss an entire week of class, discuss it with me as soon as possible.

Office hours and live sessions (optional)

All live, scheduled events for the course, including my office hours, are optional.

Course communication guidelines

The following are my expectations for how we should communicate as a class. Above all, please remember to be respectful and thoughtful.

Writing style

While there is no need to participate in class discussions as if you were writing a research paper, you should remember to write using good grammar, spelling, and punctuation.

Tone and civility

Let's maintain a supportive learning community where everyone feels safe and where people can disagree amicably. Remember that sarcasm doesn't always come across online. A more conversational tone is fine for non-academic topics.

Citing your sources

When we have academic discussions, please cite your sources to back up what you say. For the textbook or other course materials, list at least the title and page numbers. For online sources, include a link.

Protecting and saving your work

Consider composing your academic posts in a word processor/text editor, where you can save your work, and then copying into the Carmen discussion.

Course materials and technologies

Textbooks

Required

- [**R4DS2E**] Wickham, Çetinkaya-Rundel, and Grolemund (2023): *R for Data Science*, 2nd Edition. Electronic version: r4ds.hadley.nz. This web version of the book can be accessed freely from any web browser.

Course technology

Technology support

For help with your password, university email, Carmen, or any other technology issues, questions, or requests, contact the Ohio State IT Service Desk. Standard support hours are available at it.osu.edu/help, and support for urgent issues is available 24/7.

- Self-Service and Chat support: it.osu.edu/help
- Phone: 614-688-4357(HELP)
- Email: 8help@osu.edu
- TDD: 614-688-8743

Technology skills needed for this course

- Basic computer and web-browsing skills
- Navigating Carmen
- CarmenZoom virtual meetings for optional office hours

Required Equipment

- Computer: current Mac (macOS) or PC (Windows 10) with high-speed internet connection
- Webcam: built-in or external webcam, fully installed and tested
- Microphone: built-in laptop or tablet mic or external microphone
- Other: a mobile device (smartphone or tablet) to use for BuckeyePass authentication

Required software

Please install the **latest** versions of the following software on your computer. Even if you have installed these programs before, it is a good idea to check for updates. I will not provide support for outdated software.

- **R** https://cloud.r-project.org
- **RStudio** Desktop IDE https://posit.co/download/rstudio-desktop
- **Quarto** https://quarto.org/docs/get-started

Carmen Access

You will need to use BuckeyePass multi-factor authentication to access your courses in Carmen. To ensure that you can connect to Carmen at all times, it is recommended that you take the following steps:

- Register multiple devices in case something happens to your primary device. Visit the BuckeyePass
- Request passcodes to keep as a backup authentication option. When you see the Duo login screen on your computer, click Enter a Passcode and then click the Text me new codes button that appears. This will text you ten passcodes good for 365 days that can each be used once.

- Download the Duo Mobile application to all of your registered devices for the ability to generate one-time codes if you lose cell, data, or Wi-Fi service

If none of these options meet the needs of your situation, you can contact the IT Service Desk at 614-688-4357(HELP) and IT support staff will work out a solution with you.

Grading and instructor response

How your grade is calculated

Assignment Category	Points and/or Percentage
Participation	10%
Homework	60%
Final Exam (Project)	30%
Total	**100%**

Description of major course assignments

Participation

- Description

  You are expected to watch all lectures. The lectures will be delivered asynchronously and posted on the Carmen course webpage. There will be a discussion assignment associated with each module. Students will be prompted to post an answer to one of the "quiz" prompts from lecture or respond to prompts related to content from the lecture, for example to share an example of applying a technique, like creating a plot, or modifying an example shown in the lecture. The prompt will vary from module to module. The purpose of these assignments is to keep you engaged with the weekly pace of the material and to see what other students have shared. However, you will not see other students' posts until you have made one yourself. This is a low stakes assignment that will be graded complete/incomplete and not based on correctness. At the end of the week, you are to review the responses from other students to see other approaches to the prompt.

- Academic integrity and collaboration guidelines

  Discussion posts should be your own work. They will generally require you to repeat an example, practice a concept covered in the lectures or answer a question posed in the lecture videos. These assignments will be graded based on completion rather than correctness.

Homework

- Description

  Homework will be assigned weekly in each module, will be due on announced dates and will be graded. Learning to compute and program requires practice. Homework assignments will mainly

consist of exercises designed to reinforce the concepts covered in class during the previous week.

- Academic integrity and collaboration guidelines

  You may collaborate with classmates on your homework, **but ultimately the code that you write and submission that you make must be your own work.** For example, I encourage you to discuss strategies for solving problems, but the actual code and explanations that you write MUST be your own. Moreover, keep in mind the university policies on plagiarism. Do not copy or plagiarize anything you may find on the Internet. **You may use generative AI tools, e.g. ChatGPT or Claude, to help you understand concepts, but you should not copy and paste code from the internet or any AI tool as doing so constitutes a violation of academic integrity. If your code or any part of your submission resembles AI output or is plagiarized from another source, you will be found in violation of the academic integrity policies.**

  Violation of the Academic Integrity policies will result in your submission receiving no credit on the assignment and a referral to the Committee on Academic Misconduct.

  You are encouraged to discuss general strategies and concepts with your classmates; **however, all code you write and all work you submit must be entirely your own.** While collaboration on problem-solving approaches is permitted, the specific code, explanations, and written responses you submit MUST be your own.

  You must also adhere to all university policies on academic integrity and plagiarism. Do not copy or adapt code or text from the internet, classmates, or any other external source. Generative AI tools (e.g., ChatGPT, Claude) may be used to support your understanding of concepts, **but you may not copy and paste AI-generated code or written responses into your assignments. Submissions that resemble AI-generated output or that contain plagiarized content will be treated as academic integrity**

violations. Any violation of these policies will result in a grade of **zero** on the assignment and a referral to the **Committee on Academic Misconduct**.

Final Project

- Description

There will be a final project during the last weeks of the course consisting of data analysis and a report produced entirely within R. Students may work in groups to perform data analysis involving multiple tables of data, using skills learned in the course. Students will form a strategy for the analysis, perform the analysis and write a report to communicate what they have learned from the data.

- Academic integrity and collaboration guidelines

  Students will be given **the opportunity to choose whether they work in groups or individually. Regardless of their choice to work individually or in groups, the use of AI tools such as ChatGPT, Gemini, Copilot, Claude, DeepSeek, Gemini, etc., is NOT allowed.** Students may use the internet to look up documentation or examples, but copying any code or responses from the internet or any AI tool is not permitted **as doing so constitutes a violation of academic integrity.** Any violation of these policies will result in a grade of **zero** on the assignment and a referral to the **Committee on Academic Misconduct**.

If working in groups, students are expected to collaborate and participate in the group. The make-up of the groups will be determined by the instructor prior to the start of the Final Project period. If needed, accountability will be maintained by peer-reviews.

If working individually, students are expected to complete the project on their own, and their submission should be their own original work. They should not discuss anything related to their attempt with anyone else.

Late assignments

Late homework assignments and discussions will automatically receive a 20-percentage point deduction for every day they are late. After the 5th day late, submissions will no longer be accepted. All other assignments (i.e. final project…) will not be accepted after the due date. Please pay attention to the exact date and time that an assignment is due. For example, if an assignment is due at 11:59:00 PM, and you submit it 10 seconds after at 11:59:10 PM, then it will be considered late.

If you absolutely need to turn in an assignment late and have a valid excuse, please contact me for the necessary arrangements. However, you must notify me in advance in such a situation. Exceptions to this policy will be permitted only in extreme situations such as serious injury immediately prior to an assignment being due or severe illness requiring hospitalization.

Grading Scale

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

- Under 60: E

Instructor feedback and response time

Please use the discussion board in Carmen for questions about the course material and assignments. If you have a question that is personal or that you would like to discuss privately, please email me. I will respond to questions posted on the discussion board or by email within 48 hours (except for weekends and university holidays). If you would like to meet with me over Zoom, please email me to set up an appointment.

Grading and feedback

For weekly assignments, you can generally expect feedback and grades within 10 days.

Preferred contact method

If you have an individual or sensitive question, please contact me through my Ohio State email address–not Carmen messages. I will reply to emails within 24 hours on days when class is in session at the university.

Academic policies

Academic misconduct

See Descriptions of major course assignments, above, for my specific guidelines about collaboration and academic integrity in the context of this online class.

Academic integrity is essential to maintaining an environment that fosters excellence in teaching, research, and other educational and scholarly activities. Thus, The Ohio State University and the Committee on Academic Misconduct (COAM) expect that all students have read and understand the University's Code of Student Conduct, and that all students will complete all academic and scholarly assignments with fairness and honesty. Students must recognize that failure to follow the rules and guidelines established in the University's Code of Student Conduct and this syllabus may constitute Academic Misconduct.

The Ohio State University's Code of Student Conduct (Section 3335-23-04) defines academic misconduct as: Any activity that tends to compromise the academic integrity of the University or subvert the educational process. Examples of academic misconduct include (but are not limited to) plagiarism, collusion (unauthorized collaboration), copying the work of another student, and possession of unauthorized materials during an examination. Ignorance of the University's Code of Student Conduct is never considered an excuse for academic misconduct, so please review the Code of Student Conduct and, specifically, the sections dealing with academic misconduct.

If an instructor suspects that a student has committed academic misconduct in this course, the instructor is obligated by University Rules to report those suspicions to the Committee on Academic Misconduct. If COAM determines that a student violated the University's Code of Student Conduct (i.e., committed academic misconduct), the sanctions for the misconduct could include a failing grade in the course and suspension or dismissal from the University.

If students have questions about the above policy or what constitutes academic misconduct in this course, they should contact the instructor.

Copyright for instructional materials

The materials used in connection with this course may be subject to copyright protection and are only for the use of students officially enrolled

in the course for the educational purposes associated with the course. Copyright law must be considered before copying, retaining, or disseminating materials outside of the course.

Statement on title IX

Title IX makes it clear that violence and harassment based on sex and gender are Civil Rights offenses subject to the same kinds of accountability and the same kinds of support applied to offenses against other protected categories (e.g., race). If you or someone you know has been sexually harassed or assaulted, you may find the appropriate resources at https://titleix.osu.edu or by contacting the Ohio State Title IX Coordinator at titleix@osu.edu.

Intellectual Diversity

Ohio State is committed to fostering a culture of open inquiry and intellectual diversity within the classroom. This course will cover a range of information and may include discussions or debates about controversial issues, beliefs, or policies. Any such discussions and debates are intended to support understanding of the approved curriculum and relevant course objectives rather than promote any specific point of view. Students will be assessed on principles applicable to the field of study and the content covered in the course. Preparing students for citizenship includes helping them develop critical thinking skills that will allow them to reach their own conclusions regarding complex or controversial matters.

Your mental health

As a student you may experience a range of issues that can cause barriers to learning, such as strained relationships, increased anxiety, alcohol/drug problems, feeling down, difficulty concentrating and/or lack of motivation. These mental health concerns or stressful events may lead to diminished academic performance or reduce a student's ability to participate in daily activities. The Ohio State University offers services to assist you with addressing these and other concerns you may be experiencing. If you or

someone you know are suffering from any of the aforementioned conditions, you can learn more about the broad range of confidential mental health services available on campus via the Office of Student Life's Counseling and Consultation Service (CCS) by visiting ccs.osu.edu or calling 614-292-5766. CCS is located on the 4th Floor of the Younkin Success Center and 10th Floor of Lincoln Tower. You can reach an on call counselor when CCS is closed at 614-292-5766 and 24 hour emergency help is also available 24/7 by dialing 988 to reach the Suicide and Crisis Lifeline.

Accessibility accommodations for students with disabilities

Requesting accommodations

The university strives to maintain a healthy and accessible environment to support student learning in and out of the classroom. If you anticipate or experience academic barriers based on your disability (including mental health, chronic, or temporary medical conditions), please let me know immediately so that we can privately discuss options. To establish reasonable accommodations, I may request that you register with Student Life Disability Services. After registration, make arrangements with me as soon as possible to discuss your accommodations so that they may be implemented in a timely fashion.

If you are isolating while waiting for a COVID-19 test result, please let me know immediately. Those testing positive for COVID-19 should refer to the Safe and Healthy Buckeyes site for resources. Beyond five days of the required COVID-19 isolation period, I may rely on Student Life Disability Services to establish further reasonable accommodations. You can connect with them at slds@osu.edu; 614-292-3307; or slds.osu.edu.

Religious accommodations

Ohio State has had a longstanding practice of making reasonable academic accommodations for students' religious beliefs and practices in accordance with applicable law. In 2023, Ohio State updated its practice to align with new state legislation. Under this new provision, students must be in early communication with their instructors regarding any known accommodation requests for religious beliefs and practices, providing notice of specific dates for which they request alternative accommodations within 14 days after the first instructional day of the course. Instructors in turn shall not question the sincerity of a student's religious or spiritual belief system in reviewing such requests and shall keep requests for accommodations confidential.

With sufficient notice, instructors will provide students with reasonable alternative accommodations with regard to examinations and other academic requirements with respect to students' sincerely held religious beliefs and practices by allowing up to three absences each semester for the student to attend or participate in religious activities. Examples of religious accommodations can include, but are not limited to, rescheduling an exam, altering the time of a student's presentation, allowing make-up assignments to substitute for missed class work, or flexibility in due dates or research responsibilities. If concerns arise about a requested accommodation, instructors are to consult their tenure initiating unit head for assistance.

A student's request for time off shall be provided if the student's sincerely held religious belief or practice severely affects the student's ability to take an exam or meet an academic requirement **and** the student has notified their instructor, in writing during the first 14 days after the course begins, of the date of each absence. Although students are required to provide notice within the first 14 days after a course begins, instructors are strongly encouraged to work with the student to provide a reasonable accommodation if a request is made outside the notice period. A student may not be penalized for an absence approved under this policy.

If students have questions or disputes related to academic accommodations, they should contact their course instructor, and then their department or college office. For questions or to report discrimination or harassment based on religion, individuals should contact the Civil Rights Compliance Office.

Policy: Religious Holidays, Holy Days and Observances

Disability Statement (with Accommodations for Illness)

The university strives to maintain a healthy and accessible environment to support student learning in and out of the classroom. If students anticipate or experience academic barriers based on a disability (including mental health and medical conditions, whether chronic or temporary), they should let their instructor know immediately so that they can privately discuss options. Students do not need to disclose specific information about a disability to faculty. To establish reasonable accommodations, students may be asked to register with Student Life Disability Services (see below for campus-specific contact information). After registration, students should make arrangements with their instructors as soon as possible to discuss your accommodations so that accommodations may be implemented in a timely fashion.

If students are ill and need to miss class, including if they are staying home and away from others while experiencing symptoms of viral infection or fever, they should let their instructor know immediately. In cases where illness interacts with an underlying medical condition, please consult with Student Life Disability Services to request reasonable accommodations.

Email: slds@osu.edu

Website: https://slds.osu.edu/

Address: 098 Baker Hall, 113 W. 12th Ave

Phone: 614-292-3307

Course Schedule

Refer to our Carmen course page for up-to-date assignment due dates.

Week	Module	Topics/Readings/Assignments
1 03/04 - 03/10	1	**Basic data types in R: Logical and number types** *Reading:* R4DS2E 12 (Logical vectors), 13 (Numbers)

Week	Module	Topics/Readings/Assignments
2 03/11-03/24 Spring Break (03/16 – 03/20)	2	**Dates and times** *Reading:* R4DS2E 17 (Dates and times) *Due:* Homework for Module 2
3 03/25 - 03/31	3	**Joining and working with multiple tables** *Reading:* R4DS2E 19 (Joins) *Due:* Homework for Module 3
4 04/01 - 04/07	4	**Functions and conditional execution** *Reading:* R4DS2E 25 (Functions) *Due:* Homework for Module 4
5 04/08 - 04/14	5	**Iteration** *Reading:* R4DS2E 26 (Iteration), 27 (A field guide to base R) *Due:* Homework for Module 5
6-7 04/15 - 04/27		Final Project Period. Final Project due on 04/27