

Course overview

1. **Online video lectures.** Available through YouTube for you to watch asynchronously (about 2 hours per week)
2. **Live Sessions.** Synchronous meetings to work together on practical coding exercises (about 2 hours per week)
3. (Optional) **Live Office Hours.** Synchronous meeting to ask questions about course material, homework, etc. (1 hour per week)

Where to find what you need

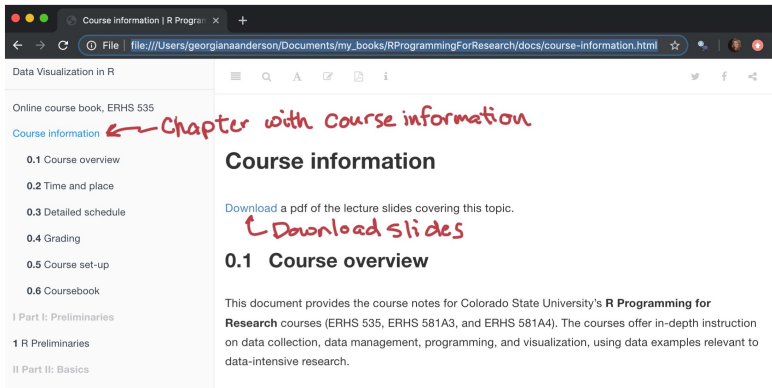
Online coursebook:

<https://geanders.github.io/RProgrammingForResearch/>

- Embedded video lectures
- Links to YouTube playlists of lectures
- PDF downloads of lecture slides
- In-class exercise prompts
- Homework assignments
- Quiz vocabulary
- Course information, including detailed schedule

Where to find what you need

- In person
 - Regularly scheduled meetings
 - Announcements at start of session
 - Breakout groups to do coding exercises in small groups
 - In-course quizzes through link (Google Forms)
 - Optional weekly office hours
 - Group work for final project
- Email
 - Reminder of assignment of video lectures to watch before live meetings
 - Repeat of major announcements
 - Homework submission, grades, and feedback
 - Quiz grades and feedback



The screenshot shows a web browser window with the address bar displaying a local file path. The page content includes a sidebar with a table of contents and a main content area. Handwritten red annotations are present: an arrow pointing to 'Course information' in the sidebar with the text 'Chapter with course information', and an arrow pointing to the 'Download' link with the text 'Download slides'.

Course information | R Program

File | file:///Users/georgianaanderson/Documents/my_books/RProgrammingForResearch/docs/course-information.html

Data Visualization in R

Online course book, ERHS 535

[Course information](#) ← Chapter with course information

- 0.1 Course overview
- 0.2 Time and place
- 0.3 Detailed schedule
- 0.4 Grading
- 0.5 Course set-up
- 0.6 Coursebook

I Part I: Preliminaries

1 R Preliminaries

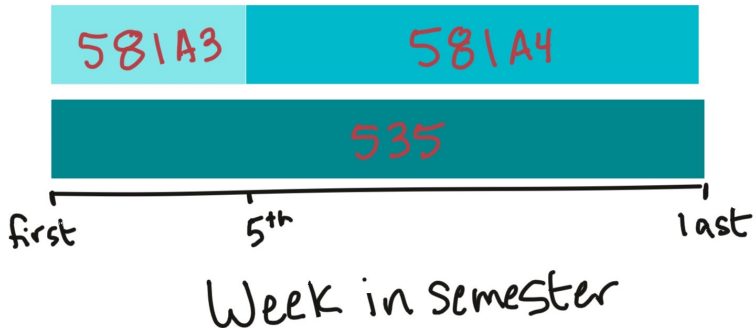
II Part II: Basics

Course information

[Download](#) a pdf of the lecture slides covering this topic. ← Download slides

0.1 Course overview

This document provides the course notes for Colorado State University's **R Programming for Research** courses (ERHS 535, ERHS 581A3, and ERHS 581A4). The courses offer in-depth instruction on data collection, data management, programming, and visualization, using data examples relevant to data-intensive research.



Time and place

- Time: Mondays 10:00 am–11:50 am and Wednesdays, **either** 10:00 am–10:55 am **or** 11:00 am–11:55 am
- Exceptions:
 - There will be no meeting on Labor Day.
 - There are no course meetings the week of Thanksgiving.
- Place: In person for exercises, online through YouTube for lectures, and [online coursebook](#)

(Some details may change depending on if we can get a bigger classroom on Mondays!)

- To be determined

Laptops

- Please plan to bring a personal laptop to all classes.
- If you do not have access to a laptop you can bring to class, talk to me and we can try to figure something out.
- If you are taking 535 or planning to continue to 581A4, we will be working with some large datasets. Please talk to me before the fifth week of class if you have limited space on your laptop.

We will cover four large themes in this course:

- Entering and cleaning data
- Exploring data
- Reporting data results
- Reproducible research

The first week covers preliminaries, and after that there will be “cycles” of covering these topics:

- **Preliminaries** Week 1
- **Basic** Weeks 2–5 (ERHS 581A3 ends here)
- **Intermediate** Weeks 6–9
- **Advanced** Weeks 10–15
- **Final** Week 16

A detailed course schedule is available in the online course book.

If you are taking ERHS 535, your grade will be determined based on the following components:

Assessment component	Percent of grade
Final group project	30
Weekly in-class quizzes, weeks 2–10	25
Homeworks 1–6	25
Attendance and class participation	10
Weekly in-course group exercises	10

Grading—ERHS 581A3

If you are taking ERHS 581A3, your grade will be determined based on the following components:

Assessment component	Percent of grade
Weekly in-class quizzes, weeks 2–5	40
Homeworks 1 and 2	30
Attendance and class participation	10
Weekly in-course group exercises	20

Attendance and class participation

You will meet twice each week in a live session.

On Mondays, everyone will meet from **10:00 AM–11:50 AM**.

On Wednesdays, there will be two “cohorts”. Half of the students will meet from **10:00 AM–10:55 AM on Wednesdays**. The other half of the class will meet **11:00 AM–11:55 AM on Wednesdays**.

I will be sending out a poll to help determine which Wednesday cohort works best for each student (starting next week).

Because so much of the learning for this class is through interactive work in class, it is critical that you come to class.

On days that you have a quiz, the quiz will also be used to assess attendance. On other days, you will fill out an “Exit Ticket” when you leave the class.

Lectures will be shared through YouTube. They are embedded in the online course book within each chapter. At the start of each chapter, you can also find a link to a YouTube playlist with all videos for the chapter.

Attendance and class participation

1.2 R and R Studio

Free and open-source software

What is R?

Watch later Share 1/10

A basic sketch of how software can be “free”:

```
graph LR; A[Software source code] --> B[Software binary code]; B --> C[Working program on your computer]; D[If you have access to this, the software is "free as in speech"] --> A; E[If you get this for free, the software is "free as in beer"] --> B;
```

- **Gratis:** Free as in beer
- **Libre:** Free as in speech

5

[Download](#) a pdf of the lecture slides for this video.

Chapter 1 R Preliminaries

The video lectures for this chapter are embedded at relevant places in the text, with links to download a pdf of the associated slides for each video. You can also access [a full playlist for the videos for this chapter](#).

Attendance and class participation

The screenshot shows a YouTube browser window. The address bar displays the URL: `youtube.com/playlist?list=PLUGPtWgRXxqK1d-3V2MKCad24h-v75k8P`. The page title is "Chapter 1 of R Programming for Research". The left sidebar contains navigation links: Home, Trending, Subscriptions, Library, History, Your videos, Watch later, Week 1 of R Program... (highlighted), and Liked videos. Below these are subscription categories: Music, Sports, and Gaming. The main content area features a video player with a diagram titled "Free and open-source software" showing a flow from "Software source code" to "Software binary code" to "Working program on your computer". Below the player, the title "Chapter 1 of R Programming for Research" is displayed, followed by "10 videos • Updated today" and "Public". A description states: "Lecture videos corresponding to the 'Preliminaries' chapter of 'R Programming for Research', the coursebook for CSU's course with the same name. The book chapter is available at <https://geanders.github.io/RProgrammingForResearch/r-preliminaries.html>". To the right, a "SORT BY" section lists five videos by Brooke Anderson: "What is R?" (12:21), "R and RStudio" (3:30), "Talking to R" (5:30), "Function calls" (8:26), and "Objects and assignment" (9:08).

Chapter 1 of R Programming for Research

10 videos • Updated today

Public

Lecture videos corresponding to the "Preliminaries" chapter of "R Programming for Research", the coursebook for CSU's course with the same name. The book chapter is available at <https://geanders.github.io/RProgrammingForResearch/r-preliminaries.html>

What is R?
Brooke Anderson
12:21

R and RStudio
Brooke Anderson
3:30

Talking to R
Brooke Anderson
5:30

Function calls
Brooke Anderson
8:26

Objects and assignment
Brooke Anderson
9:08

Attendance and class participation

You will be responsible for watching certain videos *before* you attend each live session. You will receive an email reminder with the list of videos you need to watch before each meeting. There will be about two hours worth of video lectures each week, broken into videos about 10–15 minutes each.

This week, you will be responsible for watching the first nine videos in Chapter 1 (“R Preliminaries”). The full schedule of lecture videos is available in the online-coursebook under the detailed class schedule.

Attendance and class participation—ERHS 581A3

If you are in **ERHS 535**, out of a possible 10 points for class attendance, you will get:

- **10 points** if you miss two or fewer classes
- **8 points** if you miss three classes
- **6 points** if you miss four classes
- **4 points** if you miss five classes
- **2 points** if you miss six classes
- **0 points** if you miss seven or more classes

Attendance and class participation—ERHS 581A3

If you are in **ERHS 581A3**, out of a possible 10 points for class attendance, you will get:

- **10 points** if you miss one or fewer classes
- **8 points** if you miss two classes
- **6 points** if you miss three classes
- **4 points** if you miss four classes
- **2 points** if you miss five classes
- **0 points** if you miss six or more classes

Attendance and class participation

Excused absences:

- Attendance this week will not be counted
- CSU-related: This is typically missing to attend a conference or for a field study for your research. To be excused, this requires a letter/email from your adviser.
- Serious medical issue.
- For an absence to be excused, you must email me a copy of the letter (if required) by 5:00 pm the Friday afternoon following the class you missed.

Weekly in-course group exercises

- As long as you are in class and participate in these exercises, you will get full credit for this component.
- **If you miss a class**, to get credit towards this component of your grade, you will need to turn in a few paragraphs describing what was covered in the exercise and what you learned.
- To get credit for this, you must submit it to me by email by 5:00 pm the Friday afternoon of the week of the class you missed.
- All in-class exercises are included in the online course book at the end of the chapter on the associated material.

Homework

- In approximately the first five weeks, there will be two homework assignments (see detailed schedule in the online course book). There will be six over the course of the semester.
- The first should be done individually.
- Homeworks will be graded for correctness, but some partial credit will be given for questions you try but fail to answer correctly. Some of the exercises will not have “correct” answers, but instead will be graded on completeness.

Homework

B Appendix B: Homework | R P x +

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Data Visualization in R

Online course book, ERHS 535

Course information

I Part I: Preliminaries

1 R Preliminaries

II Part II: Basics

2 Entering and cleaning data #1

3 Exploring data #1

4 Reporting data results #1

5 Reproducible research #1

Appendices

A Appendix A: Vocabulary

B Appendix B: Homework

B Appendix B: Homework

This section provides the homework assignments for the course.

B.1 Homework #1

Due date: Sept. 11 by 5:00 pm

For this assignment, you will submit the assignment to me **by email** by the due date. You should include three files in your submission:

1. A Word document with seven paragraphs. Each paragraph should be headed with the name of one swirl lesson and the body of the paragraph should describe that lesson and what you learned from

Homework assignments

Homework

- Homework is due to me by email by midnight on the due date.
- Your grade will be reduced by 10 points for each day it is late, and will receive no credit if it is late by over a week.

In-class quizzes

- You will have quizzes weekly, starting next Wednesday
- Quizzes will be on Wednesdays at the start of class (first 10–15 minutes)
- For students in ERHS 535, quizzes will continue until week 10 of the course
- Quizzes will be conducted through Google Forms. They will be immediately graded, and you will get back your grade and feedback as soon as you submit the quiz.

In-class quizzes

- Quiz questions will be multiple choice, matching, short-answer, or similar styles of questions. The questions are designed so that each can be answered fairly quickly.
- If you miss a class with a quiz, you may make it up during office hours on the week of the missed quiz. Except in exceptional circumstances, this will be the only time when make-up quizzes will be offered.

In-class quizzes

- There will be *at least* 10 questions per quiz. Usually, there will be 12–15.
- If you get, on average, 10 correct questions per quiz, you will get the maximum possible points for the quiz component of your grade.

In-class quizzes

For ERHS 535 (nine quizzes total):

$$\text{Quiz grade} = 25 * \frac{\text{Number of correct quiz answers}}{90}$$

For ERHS 581A3 (four quizzes total):

$$\text{Quiz grade} = 40 * \frac{\text{Number of correct quiz answers}}{40}$$

Note: You can not get more than the maximum of for this component quiz component (25 points for ERHS 535 students, 40 points for ERHS 581A3 students).

In-class quizzes

- The “Vocabulary” appendix of our online book has the list of material for which you will be responsible for this quiz.
- Most of the functions and concepts will have been covered in class, but some may not.
- You are responsible for going through the list and, if there are things you don't know or remember from class, learning them. To do this, you can use help functions in R, Google, StackOverflow, books on R, ask a friend, and any other resource you can find.

In-class quizzes

A Appendix A: Vocabulary | R F X +

← → ↺ File | /Users/georgianaanderson/Documents/my_books/RProgrammingForResearch/docs/appendix-a-vocabulary.html ☆ 🔍 👤

Data Visualization in R

Online course book, ERHS 535

Course information

I Part I: Preliminaries

1 R Preliminaries

II Part II: Basics

2 Entering and cleaning data #1

3 Exploring data #1

4 Reporting data results #1

5 Reproducible research #1

Appendices

A Appendix A: Vocabulary

A.1 Quiz 1—R Preliminaries (Updated for 2018)

You will be responsible for knowing the following functions and vocabulary for the weekly quizzes.

A Appendix A: Vocabulary

You will be responsible for knowing the following functions and vocabulary for the weekly quizzes.

A.1 Quiz 1—R Preliminaries (Updated for 2018)

- Grading policies for the course
- Course requirements / policies for in-class quizzes
- Open source software
- “free as in beer” versus “free as in speech”
- Difference between R and RStudio
- R packages

will be updated by Wednesday before quiz

Vocabulary for quizzes

An example of the vocabulary list:

- `mean()`
- `read_csv`, argument `skip =`
- R object
- open source software
- Hadley Wickham

- Using R frequently in your research or other coursework will also help you prepare.
- Working on your homework assignments will also help you prepare.

What you have due soon

- Wednesday, Aug. 31, during class: First in-class quiz. The “Vocabulary” appendix of our online book has the list of material for which you will be responsible for this quiz (Quiz 1 list).
- Monday, Sept. 12: First homework is due by midnight by email.