# Course Overview

# Time and place

- Time: Monday afternoons, 2:00–4:30 pm
- Exception: No meeting on Labor Day (Monday, Sept. 7)
- Place: Microbiology Build A, 114

# Content

An overview of the course content is available online.
We will cover four large themes in R programming for research:

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

# Content

The first course is preliminaries, and after that there will be three "cycles" of covering these topics:

- **Preliminaries** Week 1, August 24
- **Basic** Weeks 2–5, August 31, September 14, 21, and 28
- **Intermediate** Weeks 6–9, October 5, 12, 19, and 26
- **Advanced** Weeks 10–13, November 2, 9, 16, 30
- **Final** Week 14, December 7

# Grading

- **30 points** Participation
- **25 points** Weekly journal
- **25 points** Final group project
- **20 points** In-class quizzes

Extra credit: - **10 points** Extra credit project

# Participation

Includes attendance and in-class group work.
Because we only meet once a week, we don't have many class sessions for a 3-credit course. It is critical that you come to class.
Out of a possible 30 points for class attendance, you will get:

- **30 points** If you attend all classes
- **20 points** If you miss one class
- **10 points** If you miss two classes
- **0 points** If you miss more than two classes

# Participation

In some cases, you may be able to join an independent-study version of this course if you are going to miss a class. This will be at the instructor's (my) discretion. I will not consider it if you do not contact me at least the Thursday before the class meeting you will miss to see if we can arrange it.

# Weekly journal

You will have a journal entry due for every week of the course. It will always be due by 12:00 pm (noon) the Friday after the class meeting.
Out of 25 possible points for your journal, you will get:

- **2 points** For each journal entry emailed to me by the deadline (noon the Friday following class)
- **1 point** For each journal entry emailed to me after the deadline but before the next class period, which is the next Monday at 2:00pm (you may not get feedback on these)
- **0 points** For any entry sent in after the next class period starts (Monday 2:00pm)

*The astute reader will notice that there is one point of wiggle room here. . .*

# Weekly journal

I expect you to spend at least three hours each week outside of class using R. I hope that you will use it for relevant research projects or coursework, which is why I am asking for journal entries rather than assigning generic homework.

Your weekly journal entry needs to tell me what you've tried out in R that week. Let me know what work, what you couldn't get to work, and what you would have liked to have done but didn't even know where to start. Include details like what commands you used a lot, what packages you used, etc.

I will provide feedback on all journal entries turned in by the full-credit deadline.

# Weekly journal

Expectations for your weekly journal will change over the course:

- **Weeks 1–5**: <2 pages per week, Word document
- **Weeks 6–9**: <6 pages per week, Word document created from R Markdown file, should include some R output
- **Weeks 10–13**: <20 pages per week, **only one per group**, Word document created from R Markdown file, should include some R output, should document progress on your final group project

# Weekly journal

- It is fine if your entry is well below the page limit some weeks, as long as it is clear from the entry that you spent at least 3 hours that week using R.
- The closer you get to the page limit, the more feedback I'll be able to give to help you with what you're trying to do
- If you are working with senstive data, talk with your supervisor about this part of the class, and let's see if we can figure out how to ensure proper data security

# Final group project

The final group project will be graded with A through F, with the following point values (out of 25 possible):

- **25 points** for an A
- **20 points** for a B
- **15 points** for a C
- **10 points** for a D
- **5 points** for an F

If you turn nothing in, you will get **0 points**.

# Final group project

You will do the final group project in groups of 2–3. The final product will be a statistical blog post-style article of 3,000 words or less. Come up with an interesting question you'd love to get the answer to that you think you can find data to help you answer. You will need to use the data you find, and R, to write your article. The final product will be a Word document created from an RMarkdown file.

# Final group project

You will have in-class group work time during weeks 10–12 (at least) to work on this. This will also require some work with your group outside of class. You will be able to get feedback from me through your weekly journal entries in these weeks. I will also provide feedback and help during the in-class group work time.

# Final group project

To get an idea of what your final product should look like, check out these links:

- Does Christmas come earlier each year?
- Hilary: the most poisoned baby name in US history
- Every Guest Jon Stewart Ever Had On "The Daily Show"
- Should Travelers Avoid Flying Airlines That Have Had Crashes in the Past?
- Billion-Dollar Billy Beane

# Final group project

We will discuss expectations and grading for this, create groups, etc. around the middle of the semester. The focus for this will not be so much on the statistical analysis, but rather on finding, cleaning, and using good data to answer an interesting question, and on presenting, summarizing, and explaining the data well.

# In-class quizzes

You will have eight total in-class quizzes. You will have one for each of the Week 2–9 class meetings.
There will be *at least* 10 questions per quiz. You will get 1/3 point for each correct answer.
If you do the math, you can get full credit for this if you get at least 75% of your answers right...
You can not get more than the maximum of 20 points for this component.

# In-class quizzes

- All quizzes will be multiple choice, matching, or some other form of "close-answered" question (i.e., no open-response-style questions).
- You **can not** make up a quiz for a class period you missed. You can still get full credit on your total possible quiz points if you miss a class, but it means you will have to work harder and get more questions right for days you are in class.
- I **will not** ever re-consider the score you got on a previous quiz, give points back for a wrong answer on a poorly-worded question, etc. However, if a lot of people got a particular question wrong, I will be sure to cover it in the next class period. Also, especially if a question was poorly worded and caused confusion, I will work a similar question into a future quiz– in addition to the 10 guaranteed questions for that quiz– so every student will have the chance to get an extra $1/3$ point of credit for the question.

# In-class quizzes

- I will post the material you will be responsible for (functions, concepts, etc.) in a file on GitHub (on the QuizMaterial page) by midnight the Monday before the 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.
- Using R frequently in your research or other coursework will also help you prepare.

# In-class quizzes

An example of the kind of list you might see:

- `c()`
- `data.frame()`
- `dim()`
- `head()`, option `n =`
- `read.csv`, options `head =`, `skip =`, `nrow =`
- `[...]`, `[..., ...]`
- open source software
- Nate Silver

# Extra credit project

Up to **10 points** possible. We will go over details of possible projects in next week's class.

# What you have due soon

- Friday, August 28 by 12:00 pm (noon): <2 page journal entry for the week, describing how you used R. This can include details of setting up R / RStudio, including any problems you had and how you resolved them. It could also cover working through any of the in-class group exercise you didn't get time to do today. It must be a Word document. Email this to me at `brooke.anderson@colostate.edu`
- Monday, August 31 during class: First in-class quiz. I will post by midnight tonight the list of material that you will be responsible for. I will email the link to that list once it is posted on GitHub.