

Lecture 1.1 – Intro to the Course

Specific Learning Objectives:

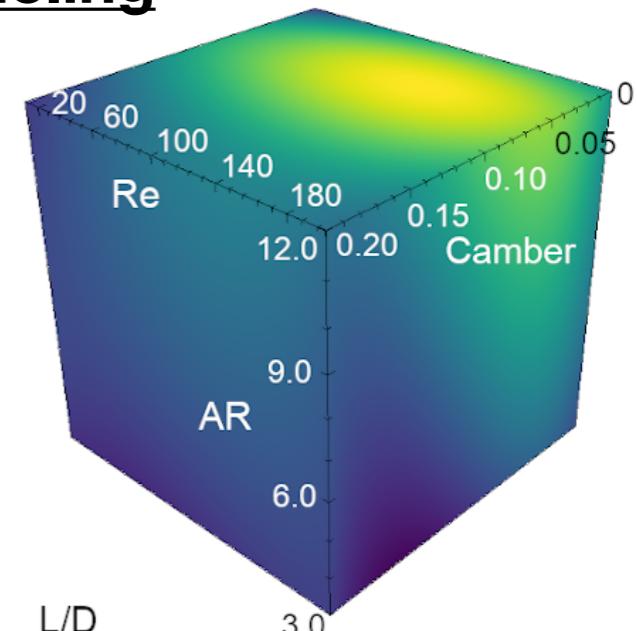
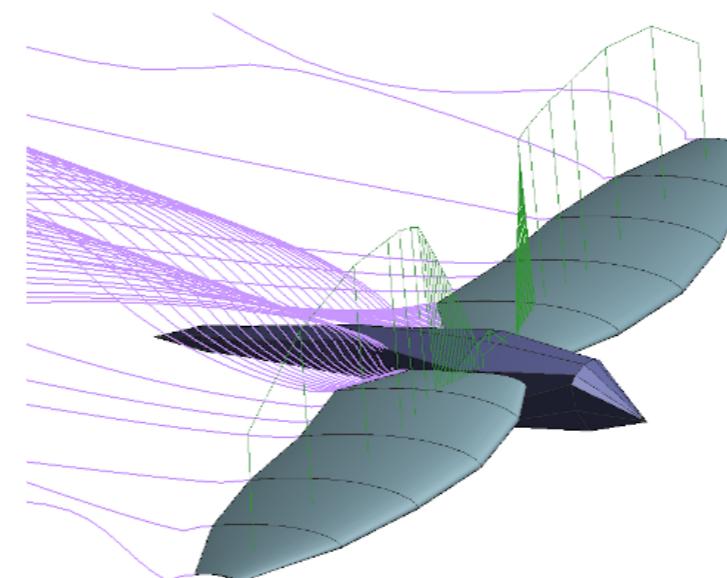
None

Exploring the evolution of biological fluid-structure interactions

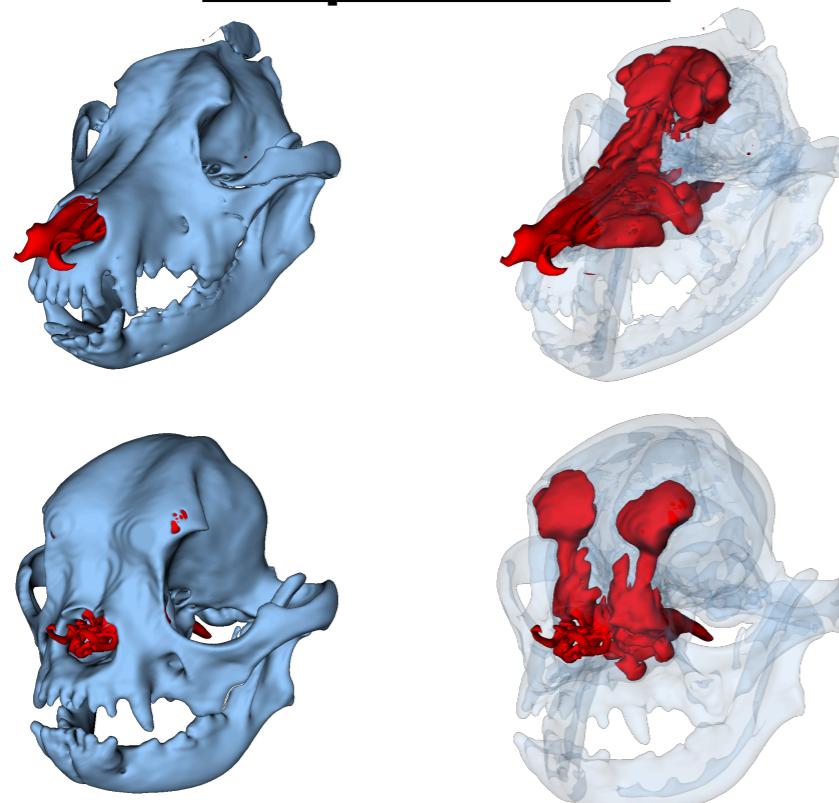
High-speed videography



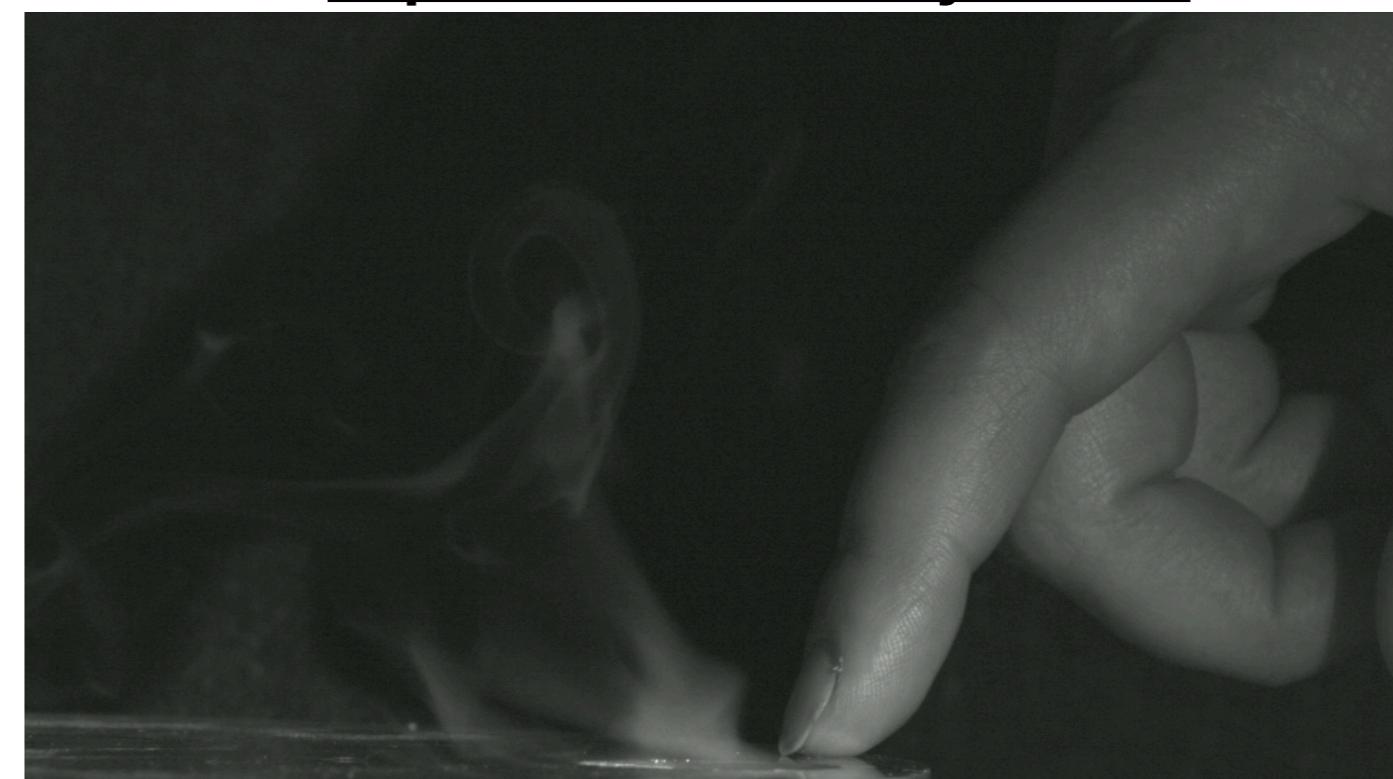
Computational fluid dynamics modeling



Morphometrics



Experimental fluid dynamics



Student Office Hours

Lindsay Waldrop, Ph.D.

**Wed 3:30 – 5 pm
Thur 11:30 am – 1 pm
by appointment**

Katherine Hansen, M.S.

TBD

What are office hours and why should you come?

- Office hours are for students! You are not bothering or interrupting us, this is time we set aside every week for my students!
- They are a great place to get clarification on content, ask questions, listen to other students ask questions, practice work, etc.
- They are also a great space for mentorship: career advice, info on graduate schools, exploring things that interest you, connecting with research, etc!

Course Navigation

- ***Where do I find course information?***

Github repository: <https://github.com/CPSC-292/Fall2023-CourseInfo>

- syllabus
- course schedule
- course learning objectives
- course assignments
- lecture notes
- sample code

- ***Where do I find and turn in assignments and see my grades?***

Course Canvas sites:

MWF 11 - 12 (Section 01): <https://canvas.chapman.edu/courses/55347>

MWF 12 - 1 (Section 02): <https://canvas.chapman.edu/courses/55354>

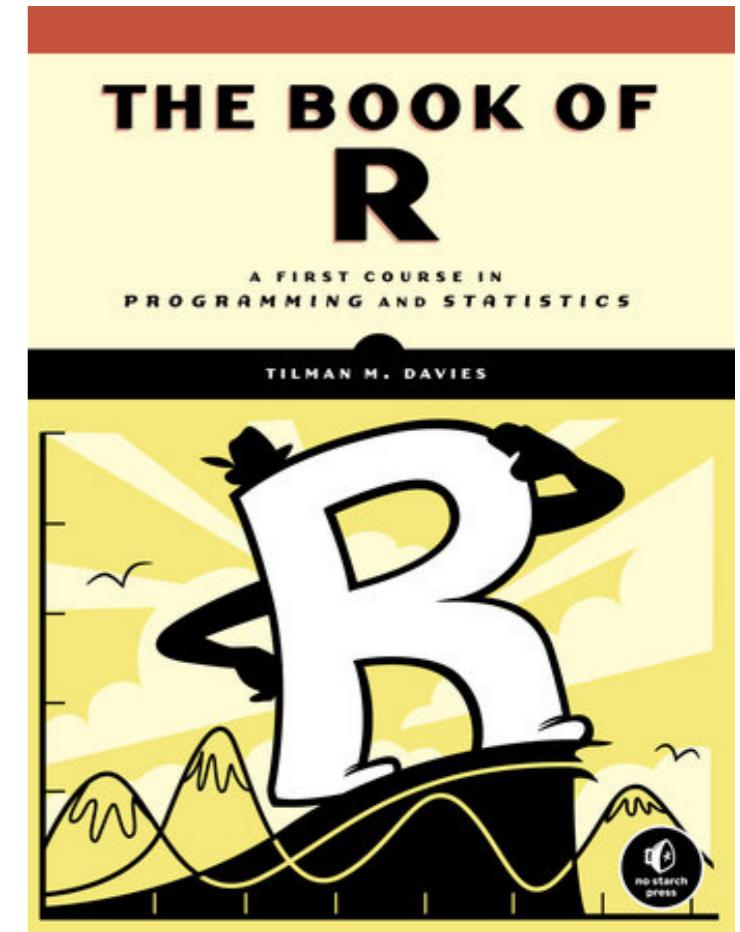
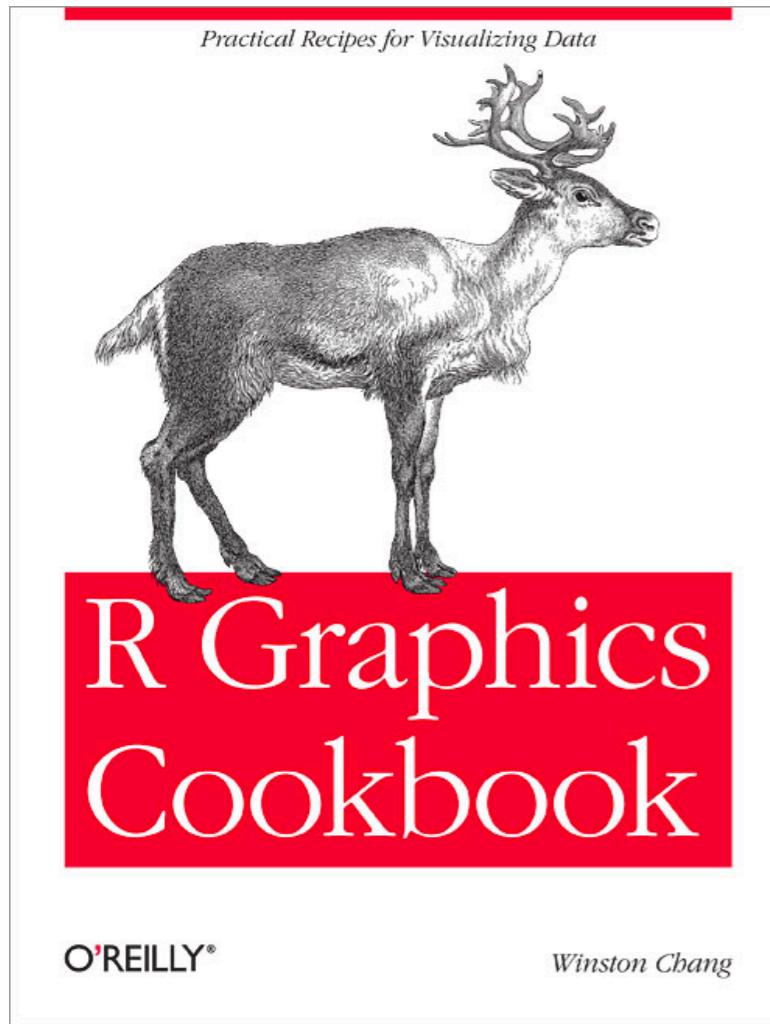
MWF 9 - 10 (Section 03): <https://canvas.chapman.edu/courses/56927>

- ***What is the best way to communicate?***

Slack Channel! Link in Canvas Module!

Course Materials

- **Required Text:** *The Book of R* by Tilman Davies.
First Edition, No Starch Press. ISBN-13: 978-1-59327-651-5.
Link to publisher website: <https://nostarch.com/bookofr>



- **Suggested Text:** *R Graphics Cookbook* by Winston Chang.
First Edition, O'Reilly Media. ISBN 9781491978603.
Online at: <https://r-graphics.org/>

How this course works

- This is a **labor-based** and **mastery-based** course.
- Your grade in this course will be determined by:
 1. Your labor and participation.
 2. Completion of work will indicate level of mastery of course material.

Grading System (Labor)

- All work is assessed on a three-tiered scale:
 - **Completed and Satisfactory** (score of 1)
 - **Completed and Unsatisfactory** (score of 0) - you will receive feedback and have another opportunity to achieve satisfactory level.
 - **Not Completed** (score of 0) - no late work will be accepted.
- **Life Happens Clause:** request a new deadline for any assignment within 48 hours of the deadline. Request via Slack to *your* instructor. ***Be sure to include the new deadline you are requesting.***

Grading System (Labor)

- **Rescoring work:** You are allowed 4 attempts for each work item (except Projects).
 - Each attempt must be made within 3 business days of receiving feedback from the instructor.
 - **It is critical that you keep up-to-date with material** (especially in Unit 1).
- **Participation is required at all levels.** Non-participation is marked only. Reasons: absence, excessive lateness (>10 mins), off task, distraction, etc.

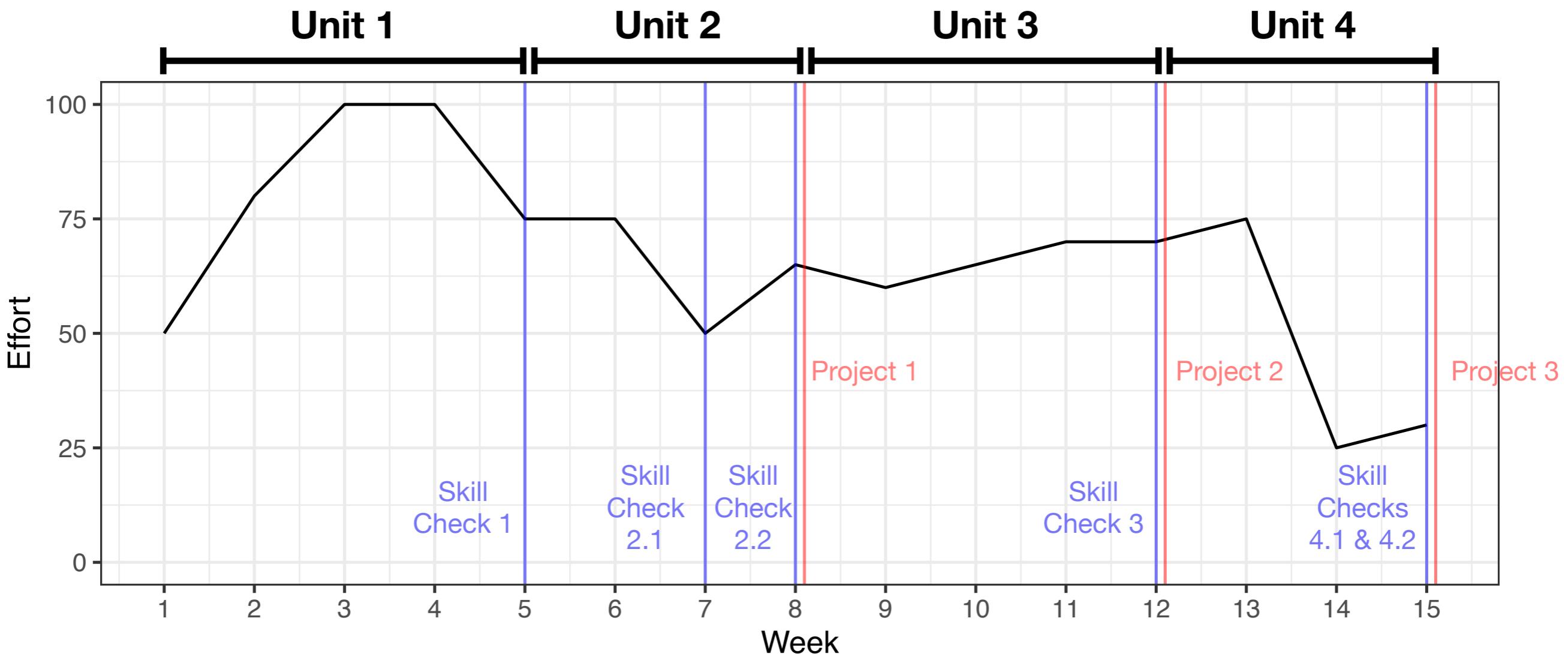
Grading System (Mastery)

- Work is designed to demonstrate levels of mastery in the material.
 - **Assignments (C-level):** Designed to assess *basic competence* of learning objectives covered. Flexible number.
 - **Skill Checks (B-level):** Designed to assess *advanced competence* of learning objectives covered. Usually involve synthesis of concepts and more independence than assignments. 6 in total.
 - **Projects (A-level):** Designed to assess *mastery* of learning objectives covered. Work will involve synthesis, creativity, independence, and originality. 3 in total.

Grading System (Mastery)

Final Course Grade	Projects completed (A-level)	Skill Checks completed (B-level)	Assignments completed (C-level)
A	3	6	100 %
B	1	6	100 %
C	0	2	100 %
D or F	0	< 2	< 90 %

A Word about the Amount of Work...



- This course's effort is front-loaded.
- Unit 1 moves quickly, contains half of all course assignments!
- **Critically important to keep up with assignments in Unit 1.**

Other Course Policies

- Masks are not required, but please be respectful of others' choices.
- Come prepared to learn and participate!
- Final project policy: you **MUST** participate in the final project.
- Group work is encouraged unless the assignment is an *individual evaluation*.
- Communication: Please Slack instead of email. Expect replies between 9 am and 5 pm during the regular work week.

What if you need help?

- ***Please contact us!*** We want to help, whether it is situational, financial, or academic. We are prepared to be very flexible, including issuing course incompletes (which can be finished later).
- The Dean of Students can help connect you with services, no matter what type of problem you have!
- If you are struggling mentally, please talk to me or seek help through Student Psychological Counseling Services:
[https://www.chapman.edu/students/health-and-safety/
psychological-counseling/](https://www.chapman.edu/students/health-and-safety/psychological-counseling/)

Course Learning Objectives



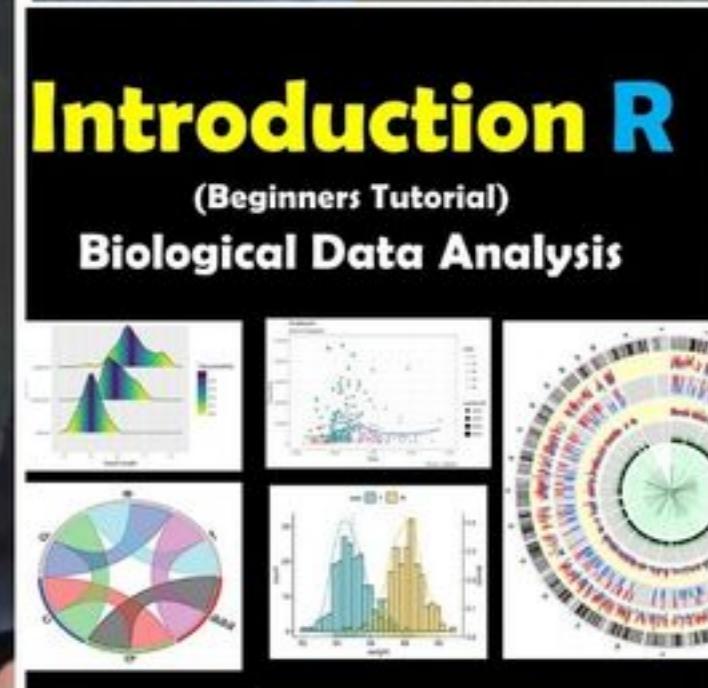
Main Learning Objectives:

1. Understand the basic structure and function of the *R* programming language.
2. Create visualizations and data analyses in the *R* programming language.
3. Independently perform basic data analysis and visualizations in a way that communicates ideas clearly.

Detailed learning objectives (and how they are assessed) are in the file CLO.pdf!

Why Learn *R*?

- Biology today involves lots and lots and lots of data!
- Most disciplines require skill in handling and analyzing data.
- *R* is a high-level yet powerful programming language that can assist with statistics, analysis, and visualization.
- *R* is free and open-source, making analyses replicable.
- *R* is flexible and has a huge community working on new stuff!



It's true. Sorry :(

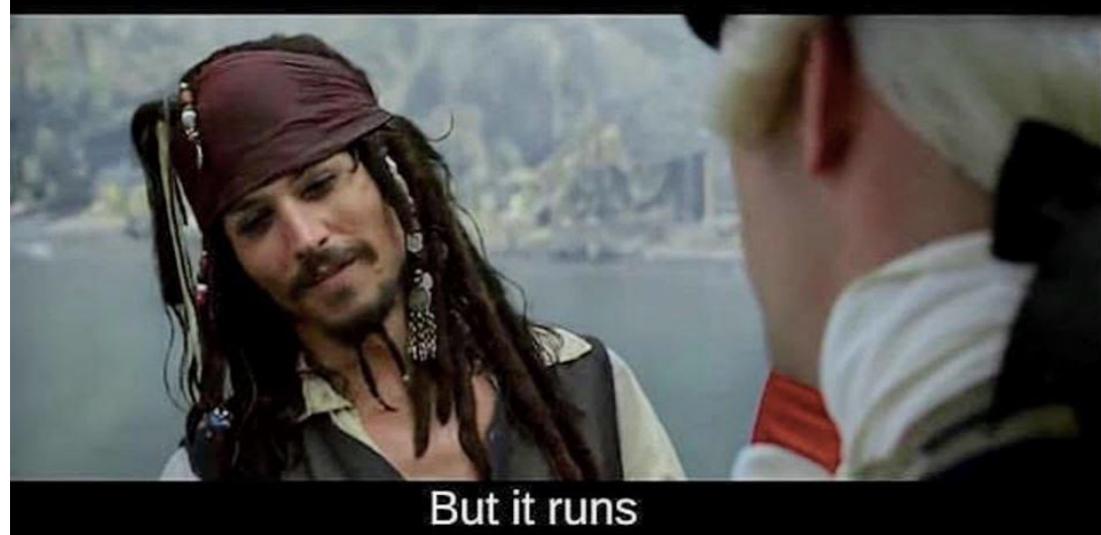


Don't fret - You can do it

- You really don't have to be good at it, but you'll definitely get better!



Yours is without a doubt the worst code I've ever run



But it runs

- It ain't got to be pretty, it's just got to work.

The Bad News is...

- The only way to learn a new programming language is to practice. A LOT.

David Neuizerling (@mdneuzerling) · 1h

Extremely disappointed to report that the best way to learn a new programming language is to read and write lots of code in that language 😞

4 11 69

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This is a screenshot of a tweet from David Neuizerling (@mdneuzerling). The tweet reads: "Extremely disappointed to report that the best way to learn a new programming language is to read and write lots of code in that language 😞". It has 4 replies, 11 retweets, and 69 likes. The interface shows standard Twitter interaction icons.

The GOOD News is...

- These skills are in high demand from employers and potential graduate school advisers.

IT WILL BE WORTH IT!

Taal Levi (@taaltree) · 13h

Recently graduated students:
Jobs all want me to know R. Why didn't anyone teach R?

Instructor:
Whew, it was a lot of work but I've added many R labs and training modules to my course!

Undergraduates:
Ugh, R is so hard, why are we learning R?
Unfair! What about my grade!

8 6 108

...

This is a screenshot of a tweet from Taal Levi (@taaltree). The tweet is divided into three sections: 1) Recently graduated students: "Jobs all want me to know R. Why didn't anyone teach R?", 2) Instructor: "Whew, it was a lot of work but I've added many R labs and training modules to my course!", and 3) Undergraduates: "Ugh, R is so hard, why are we learning R? Unfair! What about my grade!". It has 8 replies, 6 retweets, and 108 likes. The interface shows standard Twitter interaction icons.

Icebreaker

In small groups (3-4 people), write down answers to the following questions:

1. What is your group's animal mascot?

2. What is the most unique thing someone in your group has done?

Downloading R and RStudio



Download R:
<https://www.r-project.org/>



Download RStudio:
<https://rstudio.com/products/rstudio/download/>

- 1. Go to <https://cloud.r-project.org/>**
- 2. Select your operating system.**
- 3. Select the latest release that is “notarized and signed.”**
- 4. Save and open the file, follow the instructions to install.**

- 1. Select the RStudio Desktop version.**
- 2. Download, open, and follow instructions to install.**
- 3. Open RStudio to get started!**

NOTE: be sure to select the correct chip type for Macs!

Action Items

- 1. Have R and RStudio installed on your personal computer by Wed 8/30!**

- 2. If you are having trouble with a laptop, please get help ASAP!**