CPSC 292 - Introduction to Exploratory Data Analysis

Last Updated: July 22, 2025

Syllabus

Basic Course Information

- **Class numbers:** 2700 (Section 01), 2701 (Section 02)
- **Units:** 3 units
- **Lecture Time:** Section 01: MWF, 9:00 – 9:50 am; Section 02: 10:00 – 10:50 pm
- **Lecture Location:** Leatherby Libraries Lab B14
- **Course Canvas Sites:**
  - Section 01: TBD
  - Section 02: TBD
- **Course Info Repository:** https://github.com/CPSC-292/Fall2025-CourseInfo/
- **Course Slack:** Link will be sent through Canvas

Course description: Students will learn the fundamentals of data processing and exploratory data analysis using a statistical computing language such as R. Emphasis will be placed on data cleaning, data visualization, and simple statistical analyses. (Offered every year.) 3 credits.

About the lecture: Builds basic skills in data analysis, visualization, and communication using the R programming language.

Instructor Information

Instructor: Lindsay Waldrop, Ph.D. (she/her/hers)

- *Email address:* waldrop@chapman.edu
- *Office Location:* 268 Keck
- *Office Hours:* Wednesdays 11 am - 12:30 pm; Thursdays 2 - 4 pm; by appointment.

Course Materials

Required Textbooks:

- **Required:** *The Book of R* by Tilman Davies. ISBN-13: 978-1-59327-651-5. Link to publisher website: https://nostarch.com/bookofr
- **Recommended:** *R Graphics Cookbook* by Winston Chang. First Edition, O'Reilly Media. ISBN 9781491978603. Online at https://r-graphics.org/
- **Course fees:** none.

Course Learning Outcomes

At the completion of this course, students should be able to:

1. Understand the basic structure and function of the *R* programming language.
2. Understand and follow best practices in scientific computing.
3. Independently create and perform basic data analysis and visualization in a way that communicates ideas clearly.

Program Learning Outcomes

This course provides students with training in the following program learning outcomes (identified by degree):

- (Biological Sciences) Students will apply quantitative reasoning and analysis to biological science problems.

- (Biological Sciences) Students will evaluate primary literature.
- (Computer Science) Graduates will have mastered the foundational principles of computing and problem solving.
- (Computer Science) Graduates will be able to present technical information in both oral and written formats.

About the Course

This course operates on a labor-based and mastery-based grading system, meaning that:

- your labor and participation in course materials determines the grade you receive; and
- the completion of work will directly indicate your level of mastery with the material.

How Student Work is Assessed (Labor-based System)

All work is scored on a three-tiered scale:

- completed and satisfactory (score of 1),
- completed and unsatisfactory (score of 0), or
- not completed (score of 0).

If an item does not reach a satisfactory level, you will have the opportunity to revise it after receiving instructor feedback and/or peers to move it up to the completed and satisfactory level. All assignments may be submitted up to three times in total for scoring, although each attempt must be made within three business days of receiving comments back from instructors. (For example, if you receive feedback on a Monday, you must submit another attempt by end-of-day on Thursday of that week. If you received feedback on a Thursday, you must submit another attempt by end-of-day on Tuesday of the following week.)

Types of Work (Mastery-based System)

There are three types of work, completion of each indicates level of mastery of the material. In this class, these will be:

- **Assignments**: completion indicates *basic competence* of the learning objective(s) being assessed. (This will be C-level work.) There will be approximately 30 assignments during the semester.
- **Projects**: completion indicates *advanced competence* of the learning objective(s) being assessed. Typically, this will involve more synthesis of concepts, creativity, and originality of work than assignments to complete. (This is B-level work.) There will be 4 projects during the semester.
- **Skill Checks**: completion indicates *mastery* of the learning objectives(s) being assessed. Skill Checks, similar to traditional exams, will involve synthesis of a broad range of concepts and independence. (This is A-level work.) There will be 3 Skill Checks during the semester.

As such, completing these assignments will indicate your level of mastery in the material covered in the course.

Grade-Score Guarantees

Final Course Grade	Skill Checks completed (A-level)	Projects completed (B-level)	Assignments completed (C-level)	Course Points
A	3	4	30	47
B	1	4	30	39
C	0	2	30	32
D or F	0	< 2	< 28	< 30

In order to convert the course materials to letter grades, each type of work indicating mastery level will be converted to course points. Each skill check is worth 3 course points; each project is worth 2 course points;

each assignment is worth 1 course point. The table provides the minimum score cutoffs that will guarantee the letter grade listed in the course.

Final cutoffs for pluses and minuses on course letter grades are at the instructor's discretion and will be determined at the end of the course.

About deadlines

There will be deadlines for completion of work typically one week after the material needed to complete the item's learning objective is covered in class and the item is assigned. After this deadline, items will be scored as not complete (0). There is no "late" work accepted.

However, life happens, and you may not want to discuss with your instructor exactly what is going on to catch a break. You are allowed to invoke the **Life-Happens Clause** on any assignment item (except those during the final exam period), no excuse required. Simply request a new deadline by email or a Slack message within 48 hours of when item was due (either before or after the deadline). *You have to provide the new deadline (date and time) in the message!* You may invoke the clause as many times as needed during the semester. If it becomes habitual, consider contacting the instructor so we can work out a better timetable for submitting assignments.

Attendance and Participation

Learning depends on engagement, and engagement depends on both the relationship between students and instructors and the general learning environment. Engagement is a relationship, and like any other relationship, depends on two people: the instructor and the student. Instructors will do their part to come to class prepared with interesting material and a science-based lecture style that includes active learning techniques. You are expected to come to class prepared by completing any pre-class videos and assignments and willing to participate in your own learning. Furthermore, you are expected to help cultivate a positive and welcoming learning environment for you and your fellow students. In order to do this, class attendance *and participation* is mandatory throughout the semester.

How participation will be assessed: Days in which you don't participate will be recorded. This could be due to: absence, excessive lateness (more than 10 minutes), not working on class exercises, not engaging with group work, not engaging in lecture materials, being excessively distracted or distracting (including being off-task on the computer or phone), not viewing lesson videos in a timely manner, etc. Since no one is perfect, three absences will be overlooked during the semester. Additional absences will lead to a loss in completed work at the rate of three absences resulting in a deduction of one completed assignment.

Link between Assignments and Videos: This class is partially flipped, so that you will need to watch a video of lecture content *before* attending the scheduled lecture in which that content will be covered. The lecture will consist of in-class work on the linked assignments. *In order for the associated assignment to be marked complete, the lecture video must be completed.*

There are no make-up work except under extraordinary circumstances for which documentation exists or otherwise noted. Please attend class on time, defined as within 5 minutes of the class start time.

Other Course Policies

Generative Artificial Intelligence Tools: Generative AI (GenAI) tools (e.g., ChatGPT, Dall-e, Copilot) can offer useful information and are becoming more prevalent inside and outside of professional spaces. GenAI info can be (and often is) inaccurate and incomplete. Students in this course are responsible for the accuracy and authenticity of the material that is submitted on assignments and how to use information provided by GenAI in an ethical and responsible way.

The use of GenAI is permitted in this course for the following activities:

- brainstorming or refining ideas,
- fine-tuning visualization questions,

- finding general information about a topic,
- draft an outline to organize thoughts,
- checking grammar,
- writing conventions and style, and
- debugging and explaining code.

The use of GenAI is not permitted for the following activities (with exceptions outlined on specific assignments or projects):

- writing a draft of any course work;
- writing complete code or blocks of code for use in course work, data analysis or visualization; or
- writing entire sentences, paragraphs, or papers to complete course work.

Students are responsible for fact-checking all GenAI output and disclosing the use and nature of use of GenAI tools on all class work. Additionally, students are responsible for knowing and being able to explain the content of all course work produced with the assistance of GenAI.

General Health: Masks are not required in class or office hours, but you are free to wear one if you wish. Any student required to quarantine or isolate due to exposure to or infection with SARS-CoV-2 or similar infection will be able to attend classes remotely when possible. I am happy to work with you regarding making up class work.

Final Project Policy: You must participate in and pass the final project in order to pass the course. *There will be no exceptions to this policy.* If you are aiming for C-level work, you must attend the final exam period where projects are presented (even if you don't otherwise contribute).

Electronic Devices (phones, computers, etc): Please refrain from inappropriate usage of electronic devices during class. The instructor reserves the right to ask you to discontinue the use of any electronic device which becomes a significant distraction to your classmates or me. Switch cell phones to silent/vibrate. You may make audio recordings of the lectures for personal use, but do not share them with others or post them publicly without the instructor's written permission.

Group Work: Group work is encouraged on all assignments and during class, except those explicitly stated to be *individual evaluations*. You are free to assume that an assignment is meant to be worked on together unless otherwise directed. If you work in groups on an assignment, simply list the members of your group on the top of the assignment.

Communications: Please use a direct message on Slack rather than email. You can expect replies to emails and slacks within regular working hours (9 am to 5 pm, M-F). I will try my best to respond within one working day. Please check the syllabus before asking a question about the course. Detailed questions are best asked during office hours, you will get a better and more thorough answer. If your question takes more than 3 mins to respond to, you will be asked to come to office hours. Please treat email as formal communication; if you are unsure of how to properly format an email to your professor, please ask. Slack is far more informal; memes, tiktoks, etc. are encouraged.

Chapman University Policies

Academic Integrity Policy: Chapman University is a community of scholars that emphasizes the mutual responsibility of all members to seek knowledge honestly and in good faith. Students are responsible for doing their own work and academic dishonest of any kind will be subject to sanction by the instructor/administrator and referral to the university Academic Integrity Committee, which may impose additional sanctions including expulsion. Please review the full description of Chapman University's policy on Academic Integrity: https://www.chapman.edu/academics/academic-integrity/index.aspx

Students with Disabilities Policy: In compliance with ADA guidelines, students who have any condition, either permanent or temporary, that might affect their ability to perform in this class are encouraged to contact the Office of Disability Services https://www.chapman.edu/students/health-and-safety/disability-services/index.aspx . If you will need to utilize your approved accommodations in this class, please follow the proper notification procedure for informing your professor(s). This notification process must occur more than

a week before any accommodation can be utilized. Please contact Disability Services at (714) 516-4520 if you have questions regarding this procedure, or for information and to make an appointment to discuss and/or request potential accommodations based on documentation of your disability. Once formal approval of your need for an accommodation has been granted, you are encouraged to talk with your professor(s) about your accommodation options. The granting of any accommodation will not be retroactive and cannot jeopardize the academic standards or integrity of the course.

Equity and Diversity Statement: Chapman University is committed to ensuring equality and valuing diversity. Students and professors are reminded to show respect at all times as outlined in Chapman's Harassment and Discrimination Policy. Any violations of this policy should be discussed with the professor, the Dean of Students and/or otherwise reported in accordance with this policy.

Student Support at Chapman University

Over the course of the semester, you may experience a range of challenges that interfere with your learning, such as problems with friend, family, and or significant other relationships; substance use; concerns about personal adequacy; feeling overwhelmed; or feeling sad or anxious without knowing why. These mental health concerns or stressful events may diminish your academic performance and/or reduce your ability to participate in daily activities. You can learn more about the resources available through Chapman University's Student Psychological Counseling Services here: https://www.chapman.edu/students/health-and-safety/psychological-counseling/

Fostering a community of care that supports the success of students is essential to the values of Chapman University. Occasionally, you may come across a student whose personal behavior concerns or worries you, either for the student's well-being or yours. In these instances, you are encouraged to contact the Chapman University Student Concern Intervention Team who can respond to these concerns and offer assistance: https://www.chapman.edu/students/health-and-safety/student-concern/index.aspx . While it is preferred that you include your contact information so this team can follow up with you, you can submit a report anonymously. 24-hour emergency help is also available through Public Safety at (714) 997-6763.

Additionally, you can come talk to me at any time, for any reason. My door is open!