

Introduction to Exploratory Data Analysis

Basic Course Information

Class number: 1281 (Section 01) & 1282 (Section 02)

Units: 3 units

Lecture Time: Section 01: MWF, 11:00 – 11:50 am; Section 02: 12:00 – 12:50 pm

Lecture Location: N214 Swenson Hall

Course Canvas Sites:

- Section 01: <https://canvas.chapman.edu/courses/44305>
- Section 02: <https://canvas.chapman.edu/courses/44167>

Course Info Repository: <https://github.com/CPSC-292-Fall-2022/CPSC292-CourseInfo>

Course Slack Channel: Link will be posted in a Canvas Announcement

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

Section 01 Instructor: Lindsay Waldrop, Ph.D.

Email address: waldrop@chapman.edu

Office Location: 268 Keck

Office Hours: Wednesdays 1:30 – 3:00 pm, Thursdays 2:30 – 4 pm, and by appointment

Section 02 Instructor: Katherine Hansen

Email address: kahansen@chapman.edu

Office Location: Swenson N205

Office Hours: Mondays 9 – 11 am

Course Materials

- 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.
- (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:

1. your labor and participation in course materials determines the grade you receive; and
2. 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.)
- **Skill Checks:** completion indicates *advanced competence* of the learning objective(s) being assessed. Typically, this will involve more synthesis of concepts and independence than assignments to complete. (This is B-level work.) There will be 6 Skill Checks during the semester.
- **Projects:** completion indicates *mastery* of the learning objectives(s) being assessed. Projects will involve not only synthesis of a broad range of concepts, but also creativity, independence, and originality of work. (This is A-level work.) There will be 3 projects during the semester.

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

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 %

Failure to complete 100% of assignments will result in some Skill Checks or Projects being converted into assignments. This rate is 1 project = 3 assignments; 1 skill check = 2 assignments. If a skill check is missing, 1 project will be converted into a skill check.

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.

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 item (except those during the final exam period), no excuse required. Simply request a new deadline by email or Slack within 48 hours of when item was due. You will provide the new deadline 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 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 Panopto 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.

There are no make-up work except under extraordinary circumstances for which documentation exists or otherwise noted. Instructors appreciate you making it to class on time, defined as within 5 minutes of the class start time.

Pluses and Minuses on Course Grades

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

Other Course Policies

COVID: Wearing a mask in class is key to stopping the spread of SARS-CoV-2 and preventing illness. Please wear a mask in class and in office hours, regardless of vaccination status. If you do not have a CLEAR status email, you will be asked to leave class. Any student required to quarantine or isolate due to exposure to or infection with SARS-CoV-2 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: The instructors prefer Slack over email, please send a DM rather than an email. You can expect replies to emails and slacks within regular working hours (9 am to 5 pm, M-F). We will try our 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 > 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, and animated gifs are encouraged.

Chapman University Policies

In response to the current COVID-19 pandemic: Chapman University has developed the CU Safely Back program (CUSBP) and mandatory safety measures (<https://news.chapman.edu/corona-virus/>). The University's mandatory safety measures may be stricter than local, state or federal guidelines and may be subject to change at any time. Students are expected to adhere to the University's safety measures while attending classes, including when entering and exiting classrooms, laboratories, or other instructional areas. Individual faculty may choose to have requirements for their courses that are stricter than the University's*. Safety precautions and procedures may change in response to emerging findings and the recommendations of scientific experts and authorities. Refusal to abide by the University's mandatory safety measures or to the safety requirements specific to this course will result in your being asked to leave the area immediately, and may result in an administrative dismissal from this course. The COVID-19 pandemic requires all of us to accept the possibility that changes in how this course is taught may be required and that some changes may occur with little or no notice. For example, some or all of the in-person aspects of a course may be shifted to remote instruction. If this occurs, you will be given clear instructions as to how to proceed. The uncertainty of the situation is not ideal for any of us. We must all try to approach this situation with good-will, flexibility, and mutual understanding. (*Such requirement should be clearly described in the course syllabus.)

SEB statement of support: In response to the COVID-19 pandemic, the Chapman University Senate Executive Board supports the Faculty Task Force recommendations and the adoption of safety protocols, including symptom screening, mandatory face covers, social distancing practices, frequent hand washing or sanitizing, and frequent cleaning procedures for in-person class sessions and other on-campus activities. The SEB further supports that office hours and other meetings be held remotely, whenever possible, to minimize risks to students, faculty, and staff.

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](#).

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](#). 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 us at any time, for any reason. Our door is open!