

Introduction to Data Analysis and Visualization

Basic Course Information

Class number: 3577

Units: 3 units

Lecture Time: TR, 11:30 am – 12:45 pm

Lecture Location: Computer Lab 50A Hashinger

Course Website: https://blackboard.chapman.edu/webapps/blackboard/execute/modulepage/view?course_id=_54453_1&cmp_tab_id=_87025_1

Course Description: Computer Science experimental courses are designed to offer additional opportunities to explore areas and subjects of special interest. Course titles, prerequisites, and credits may vary. Some courses require student lab fees. Specific course details will be listed in the course schedule. May be repeated for credit if the topic is different. Fee: TBD. (Offered as needed.) .5-4 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.

Email address: waldrop@chapman.edu

Office Phone: (714) 516-5615

Office Location: 268 Keck

Office Hours: Tuesdays 9 – 11 am, Wednesdays 2 – 4 pm, and by appointment. (Subject to change.)

Course Materials

- *Learning R* by Richard Cotton. First Edition, O'Reilly Media. ISBN 9781449357108
- *R Graphics Cookbook* by Winston Chang. First Edition, O'Reilly Media. ISBN 9781491978603
- Course fees: none

Course Learning Outcomes:

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

1. Load, manipulate, and graph data sets in the *R* programming language.
2. Understand the basic structure and function of the *R* programming language.
3. Understand the basic principles of data visualization and communication.
4. Independently 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.

Course Policies

General Expectations: 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. I will do my part to come to class prepared with interesting material and a science-based lecture style that includes active learning techniques. I expect you to come to class prepared by completing any assignments and willing to participate in your own learning. Furthermore, I expect you to cultivate a positive and welcoming learning environment for you and your fellow students.

Grading Scheme:

- **Participation (25%):** Class participation includes attendance at all class meetings, being an active participant in your own learning, asking and answering questions, etc.
- **Written Assignments (25%):** Includes discussion assignments, homeworks, and other assignments.
- **Workshops (25%):** There will a number of workshop days during the semester to assess goal-oriented progress. These will cumulatively be worth 25% of your final grade.
- **Final Project (25%):** There is one final project at the end of the course worth 25% of the course grade.

Methods of evaluation:

- Students will be evaluated by a series of homeworks due following each lecture (to be turned in before the next class period). Scoring will be based on completing exercises on homeworks and their timely submission.
- Students will be evaluated by participation, which will include attendance, in-class participation in exercises and activities, and attending office hours (optional).

- Students will be evaluated through a series of workshops which are designed to assess the student's ability to complete programming/visualization tasks related to the previous lecture content. The work will be evaluated based on the successful completion of the task in the allotted time (which will vary with each workshop).
- Students will be evaluated on their effectiveness at communicating both written and orally during the final project. Presentations will be assessed by both the instructor and other students in the course according to rubric to be provided ahead of the due date of the project.

Grading Policies:

- In order to provide you with timely feedback, I will grade work as soon as possible following the due date and time, so no late work will be accepted (with exception of the Life Happens Clause, see below). If you have difficulties that may interfere with your coursework, please let me know as soon as possible, and we can work something out.
- My feedback tends to be very direct, which can be off putting to some students. I want to see you succeed, and the best way for me to do that is to tell you what you are doing well, and what you could be doing better. I strive to make my feedback constructive, so keep that in mind when reviewing feedback.
- Mistakes happen, and I am not perfect. If you find mistakes in my grading (missed points, arithmetic errors, etc) or you think your work deserves a second look, please submit your argument in writing (an email is preferable) along with the original assignment within one week of when the assignment was returned, and I will take another look. I will not regrade work at the end of the semester for any reason.

The Life Happens Clause: I understand that life happens, and you may not want to discuss with me exactly what is going on to catch a break. You are allowed to invoke this clause on any written assignment during the semester one time for a 3-day extension, no questions asked. Invoke no later 24 hours after the deadline of the assignment. (If you are having additional difficulties, let me know and we can work things out.)

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.*

Electronic Devices (phones, computers, etc): Please refrain from inappropriate usage of electronic devices during class. I reserve 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 my written permission.

Group Work: I encourage group work 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.

Attendance/Absence: I expect you to attend every lecture. There are no make-up work except under extraordinary circumstances for which documentation exists or otherwise noted. I appreciate you making it to class on time, defined as within 5 minutes of the class start time.

Email: I reply to emails once a day 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 > 3 mins to respond to, I will ask you 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 me.

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](#).

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 re-

sources 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!