CS229 Introduction to Data Science with R
Fall 2021

Instructor: Dr. Weihong Ni
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Course descriptions: This course provides an introduction to data science and analytical techniques using R. Students will learn the essential concepts of R programming. They will use tools and various packages in R to perform data cleaning, processing and visualization. They will also learn basic statistics and machine learning techniques to conduct data analysis. Students from non-computer science majors are welcome.

Prerequisite: CS 101 or MA141 or MA342

Learning Objectives: By taking this course, students will be able to

- Demonstrate an understanding of the fundamental syntax of R, concepts of data frames and packages and be able to apply them to practical problems.
- Apply critical programming language concepts such as data types, iteration, control structures, functions, and logical operators by writing R programs and through examples.
- Import data and implement data wrangling in preparation for analysis.
- Visualize data using basic graphics functions as well as graphing packages.
- Build fundamental statistical learning models to analyze a data set in R.
- Interpret and communicate findings effectively in various formats to appropriate audiences.

Teaching Modality: Online SYNC, Zoom link to be obtained through Canvas.

Meeting time: Weekly on TR 8:30 - 10:10

Meeting place: Even though this course is taught virtually, students have the option to take the course on campus. Our officially assigned classroom: Boyer Hall, Room 008.
Textbooks:

1. R Cookbook, 2nd Edition: https://rc2e.com/
2. Data Science: A First Introduction: https://ubc-dsci.github.io/introduction-to-datascience/
3. R for Data Science: https://r4ds.had.co.nz/index.html

Additional materials are available from the Arcadia Library website - EBooks @ Arcadia (e.g., Ebook Central, EBSCO EBooks). Please contact Calvin Wang (wangc@arcadia.edu) in case of any questions.

Help Outside of Class:

1. Me: My available time slots will be published on Canvas calendar on the Sunday prior to each week. You must make a reservation before the actual time of the meeting.

2. Your Classmates: Talk to other students in the class to see if they can help you. Consider forming small study groups so that each of you can contribute. While I encourage you to study together, all submissions must represent your own work.

3. LRN Tutors: You may consult a tutor from Arcadia’s Learning Resource Network.

Course Assessment & Grades: Please refer to the following table for the general grading policy.

<table>
<thead>
<tr>
<th>Assessment</th>
<th>Weight</th>
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<tbody>
<tr>
<td>Attendance/Participation</td>
<td>5%</td>
</tr>
<tr>
<td>Conceptual exams</td>
<td>20%</td>
</tr>
<tr>
<td>Coding Assignments</td>
<td>50%</td>
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<tr>
<td>Final Project</td>
<td>25%</td>
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</tbody>
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I intend to give you 5 coding assignments and 2 in-class conceptual exams. It is very important that you take in-class exams on the scheduled dates. If an emergency arises which prevents you from taking an exam at the scheduled time, you must inform me at your earliest convenience.

Below please find the grading scale to be used in this course.
Submitting Assignments: All coursework submissions should be done via Canvas. Submission links will be provided under each assignment/assessment page.

How will I know how I am doing in this course? Grades will be posted on Canvas as soon as your work has been graded. Since Canvas keeps track of all of your grades, you should always be able to calculate your current grade in the course. If you need assistance, please contact me.

Late Work: A 10% penalty on scores per every 12 hours of overdue will be applied to late submissions, however, [NO] work will be accepted [48 hours] after the due date. In an event of unforeseen circumstances which prevent you from submitting your work on time, you should contact me to discuss a solution on a case-by-case basis.

Academic Honesty: You are expected to adhere to the code of academic honesty of Arcadia University. All work must be your own. You may discuss the main ideas of a given assignment with other students, but you must write the actual solutions by yourself. For group assignments, group members can share information within the group.

The following behaviors are absolutely not allowed:

- copying another student’s/group’s code, even if you modify it.
- sharing your code with another student/group.

If you want to use code from previous semesters or other code resources, such as example programs, found on the Web as part of your solutions, be sure to contact me for approval. If the instructor approves it, then you must add reference links of the code source in the beginning of your program.

If two people/groups share the same code or a significant amount of implementation details, both parties will be considered as conducting plagiarism. Please keep in mind that inadvertent plagiarism is plagiarism. If you are not sure, check with your instructor. Finally, I reserve the right to ask you to explain your code to me.

<table>
<thead>
<tr>
<th>Letter Grade</th>
<th>Numeric Grade</th>
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<tbody>
<tr>
<td>A</td>
<td>93 - 100</td>
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<tr>
<td>A-</td>
<td>90 - 92.99</td>
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<tr>
<td>B+</td>
<td>87 - 89.99</td>
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<tr>
<td>B</td>
<td>83 - 86.99</td>
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<tr>
<td>B-</td>
<td>80 - 82.99</td>
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<tr>
<td>C+</td>
<td>77 - 79.99</td>
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<td>C</td>
<td>73 - 76.99</td>
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<tr>
<td>C-</td>
<td>70 - 72.99</td>
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<tr>
<td>D</td>
<td>60 - 66.99</td>
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<td>F</td>
<td>0 - 59.99</td>
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Email communication statement: I will on occasion send important class-related Canvas Announcement/email to your Arcadia account. It is your responsibility to log in daily to see if there are any messages from me. Thank you.

Disability statement: Arcadia University provides reasonable accommodations for students with documented disabilities. If you require accommodations or other academic supports due to a physical, psychological, psychiatric or learning disability, you should contact Disability Support Services at 215-572-4033.

Title IX statement: Arcadia University is committed to assuring a safe and productive educational environment for all students. In order to meet this commitment and to comply with Title IX of the Education Amendments of 1972 and guidance from the Office for Civil Rights, the University requires faculty members to report incidents of sexual violence shared by students to the University’s Title IX Coordinator. The only exceptions a faculty member’s reporting obligation are when incidents of sexual violence are communicated by a student during a classroom discussion, in a writing assignment for a class, or as part of a University-approved research project. Information regarding the reporting of sexual violence and the resources that are available to victims of sexual violence is set forth at https://www.arcadia.edu/university/policies-guidelines/title-ix.

Statement on anti-racism: The Department of Computer Science and Mathematics at Arcadia University rejects racism and intolerance in all forms. We stand against inequality, white supremacy, racism, and police violence and are enraged at the systemic violence, aggression, and discrimination facing people of color every day in America. Our students, their families, and our community should know that we condemn the ways that society and science have historically marginalized researchers of color and neglected the many contributions they have made to our disciplines. We believe that the best science and inquiry are only possible with equity. Our department is committed to systemic, long-term actions to support our Black students and other community members of color who have been underrepresented and marginalized in the sciences. We pledge to be actively anti-racist in our classrooms and community and strive to use the tools of mathematics, computer science, actuarial science and data science to effect change. We take Arcadia’s mission of inclusivity and actions towards social justice seriously. To all of our students: You belong here, and we are proud to be your professors, colleagues, and mentors.

On-campus guidelines during COVID

Facilitating contact tracing:

If an individual in the class tests positive for COVID, the University will contact people who were in close proximity to that person for an extended period of time. In our class, we will utilize the following measures to facilitate this process:

Seating charts:

Use either of the following options:
• Option 1: Maintaining consistent seating can facilitate contact tracing. Please sit in the seat assigned to you on the class seating chart throughout the semester.

• Option 2: Maintaining consistent seating can facilitate contact tracing. Please sit in the same seat for the entire semester and note who is seated around you.

Cohorts for small group work:
During the semester we will frequently work in small groups for discussions or projects. Maintaining the same individuals in these groups throughout the semester will facilitate contact tracing. Please work with the same group of students consistently during the semester.

Wearing masks during class:
Masking requirements can fluctuate during the semester based on changes in the pandemic. Please follow current University mask requirements and when required to wear a mask, use it to cover your nose and mouth.
When masks are required in the classroom and a student is not wearing one, or is wearing one without covering their nose and mouth, the instructor or a fellow student can remind them to wear one or to wear one properly. If a student does not have a mask, the instructor can provide guidance for where to find one and the student can return to class after acquiring it. If a student will not wear a mask or will not wear one properly, even when provided with access to a mask, the instructor should follow normal procedures for student conduct issues.

When not to come to class in person:
To support the health and safety of Arcadia community members, please do not attend class for any of the following reasons and contact Student Health Services for assistance:

• A positive test for COVID
• Assignment to quarantine or isolation
• You feel unwell
• Notification or personal awareness that you may have been exposed to a person with COVID

Possible University-wide shifts to remote learning:
While most classes are planned for in-person participation with some remote learning opportunities, changes in the pandemic could result in shifts by the University to remote learning. Because of the availability of the vaccine and our capacity for COVID testing, such changes would likely be for short periods of time. Decisions will be made based on changes in our environment, and local, state, and national guidance.