Augsburg University
DST 234A and B: Introduction to Data Science (and R)
Syllabus Spring 2026

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All course policies are subject to change with notice.

Course Description

From the catalog:

> Concepts of data science including acquisition, tidying, and managing of data; statistical computation in R; communicating data visually; exploring ethics, social justice, and careers in data science; and analyzing data using statistical methods, including statistical modeling and an introduction to machine learning. Students who have completed MAT 213 may not register for credit. Students in MPG 2 are encouraged to take MAT 106 (instead of MAT 105). Students in MPG 3 who intend to take MAT 114 are encouraged to do so before taking this course.

We will have two main areas of focus in this course: (1) learning how to implement computational techniques to analyze data, and (2) using statistical software to visualize relationships in your data.

The specific learning outcomes of this course are:

- Make data-informed decisions using statistical analysis.
- Communicate data-based findings using data visualization techniques.
- Be aware of ethical considerations and social justice implications of data science.
- Explore data science and other data-intensive careers as a vocation.
- Build your data science skill set including
    - Compute information from data
    - Develop your statistical computing skills in R
    - Apply the data science lifecycle (import → tidy → model → visualize)

This course meets NSM (Non-lab) LAF and QFA core curriculum requirements

General Information

Section A:	Tuesdays and Thursdays 10:10-11:40 AM in Hagfors 152
Section B:	Tuesdays and Thursdays 2:00-3:30 PM in Hagfors 152
Professor:	Dr. Jiachen Zhang (zhangjia@augsburg.edu)
Office Hours:	TTH 11:50-12:20 at Hagfors 188; **OR** I have blocks of time with flexible help hours, offered both in-person at my office (Hagfors 188) or online. You may make an appointment (**in advance**) at the [scheduling link](#). These blocks are usually MWF from 10:00 - 4:00 PM.

Prerequisite: MPG 3, MAT 105 Applied Algebra, or MAT 106 Applied Algebra and Trigonometry

Text & Materials: i) *Modern Data Science with R* (2nd edition, 2021) by Baumer, Kaplan, and Horton - Online version free here: https://mdsr-book.github.io/mdsr2e/ 🥳
ii) *Data Science* by Kelleher and Tierney (available online through Lindell Library)
iii) Other open-source readings posted to Moodle.
iv) You also need access to R, RStudio, and Quatro for this class. All of these software are free -- see Moodle for information on how to access.

Technology requirements:
You need to be able to complete the following tasks:
- Check email, access Moodle resources including downloading PDFs, and posting PDFs to Moodle.
- Print PDF documents to complete freehand or annotate PDFs electronically.
- Complete data projects using an open source statistical software program and upload assignments to moodle.

Please do not be shy about letting me (or your faculty mentor/academic advisor) know if you need help acquiring or using these resources or if you need help finding a place to work where you can comfortably share video as needed.

More information about access to technology can be found here: LINK

Course Grade

Your course grade is primarily based on the following categories:

- **Daily Activities (10% of the overall course grade):** Each class session you will engage in activities and exercises that develop your understanding of the topic for the day. You are expected to attend class and engage in the activity for full credit. If you do not attend class

(either an excused or unexcused absence), you may receive partial credit for the Daily Activity through completion and submission of an extra assignment related to that day's topic. That assignment will be due at the next class period.

- **Homework (25% of the overall course grade):** Homework is due every day to make sure you keep up and to give you feedback on your progress in mastering course content. The homework will primarily be based on textbook problems (typically analyzed using R). I expect the majority of this homework to be electronically submitted using Quarto. I will provide instruction in R and Quarto at the start of the term. Some of these assignments may be submitted collaboratively as a group.
- **Ethics & Vocation in Data Science (15% of the overall course grade):** You will complete a series of readings and assignments on two topics:
  - *Ethics in Data Science:* The use (and misuse) of data and data science that impact on different communities.
  - *Careers and Vocation in Data Science:* Viewing online talks by practicing data scientists.

  In both of these cases you will submit reflective papers based on these readings and subsequent in-class discussion.
- **Quizzes (25% of the overall course grade):** You will have a series of 6 quizzes throughout the term, approximately corresponding to a chapter, or part of a chapter.
- **Mini-projects (25% of the overall grade):** You will complete a series of five projects throughout the term that will apply your knowledge and skills in data science using R.

I reserve the right to limit the amount of work to be submitted late. Pay attention to due dates for all assignments.

At the end of the course, your weighted average is converted to a course grade according to the following scale:

Percentage	Letter	Percentage	Letter	Percentage	Letter
94 – 100%	A	79 – 81.9%	C+	62 – 71.9%	D
92 – 93.9%	A-	74 – 78.9%	C	0 – 61.9%	F
89 – 91.9%	B+	72 – 73.9%	C-		
84 – 88.9%	B	(C- is minimum to pass)			
82 – 83.9%	B-				

Notes:
For this course to count toward the data science major, data science minor, mathematics major, mathematics minor, computer science minor, or statistics minor, you must earn a grade of C- or higher. For this course to serve as a prerequisite for any CSC, DST, or MAT course, you must earn a C- or higher. For any other majors or minors not listed here, please consult the respective major or minor description in the Augsburg University course catalog for specific policies.

If you elect to take this course P/LP/NP, then you must earn at least a C- to get grade P. I encourage you to talk with me or with an academic advisor if you are considering the P/LP/N option. The grade of D/LP gives you credit for the course. Under the P/LP/N option, a D grade is recorded as LP and you receive credit for this course, and an F grade is recorded as N and receive no credit for the course.

I reserve the right to lower your course grade if your attendance, punctuality, participation, or preparation falls well below expectations.

If you are not progressing towards a passing grade or if your attendance, punctuality, participation, preparation, or behavior is falling well below expectations, I will usually send a formal Academic Progress Report.

Expectations

Depending on your previous background with data science, this may be your first time encountering a statistical software program such as R. Programming requires an expanded skill set than that of what you may be accustomed to. Generally speaking (and detailed more below) is that there is an expectation of critical thinking and computational proficiency in this class. Developing these skills throughout the term will prepare you for upper-level data science courses. I expect that you will be up to the challenge and find it interesting, useful, and fun.

I want you to be successful in this course. I expect you to give your best effort to meeting these expectations and I will help you learn the material. Here is what it takes to succeed.

- ✔ Buy, rent, or have regular access to the course materials.
- ✔ Check your Augsburg email account regularly and know how to access our Moodle site, which includes your course grade.
- ✔ **Attend and participate in every class.** Every class period has specific learning outcomes and objectives. Your presence at a class period is the minimum expectation for you to learn new material. Be on time for class, be prepared for the daily activities with a positive attitude, and have all assigned homework completed. You are expected to attend each class period. If you have an occasional excused absence, send me an email as soon as possible so that I know you are okay. The instructor reserves the right to determine if an absence is excused or unexcused.
- ✔ **Late homework submission policy:** Submit work when originally due. Even if you miss class, work is still due then. While you may submit some late homework, however, no feedback may be provided. I reserve the right to limit how many and which assignments are eligible for late submission. ***You may only submit an assignment after the original due date and before the final submission deadline if you have attended that class session or have an excused absence.***
- ✔ Policies for absences and late work are summarized here: LINK
- ✔ **Pay attention during class.** The only thing you should be reading, viewing, writing, or discussing during class is the current material. No texting, taking phone calls, reading, or watching videos during class. Turn your cell phone off or set it to silent. While you may use electronic devices for taking notes (including screenshots of the lecture), participating in class, collaborative whiteboard work, calculations, or approved accommodations, they may not be used for other purposes during class.
- ✔ **Listen and think in class.** The goal is *learning*, not just transcribing what I am writing and saying. Perhaps limit your notes to short reminders of key ideas. If your notes turn out to be too vague or short in places, work on it with a classmate. If you are still stuck, come ask me about it again. I never mind repeating something as long as you've tried working on it more first.

✔ **Get help when you need it.** I know it is hard to ask for help sometimes, but please feel free to ask me. You would be wise to arrange to meet with a classmate outside of class to compare work as well. Do not wait until the last minute to get help. If you did not do well in previous college mathematics or computer science courses, or it has been a few years since you took those courses, you should make every effort to arrange your schedule to be able to attend office hours.

✔ **Read the course materials.** Read the current material *before* coming to class. Complete the pre-reading. Re-read the material discussed *after* class. Your textbook is a key learning partner and not an index of homework problems. Ask questions on the reading during class or at office hours.

✔ Complete all homework assignments with an eye on mastery, not the grade. Assigned homework problems are meant to develop your emerging understanding of the material and emphasize key concepts. (Notice that I did not say you master the concepts so you can do the homework.) Endeavor to do your best on the problems.

✔ Work with others in the class when asked to do so. Work alone when asked to do so.

✔ Form study buddies to work on problems together and discuss concepts. All homework handed in for grading, however, should be your own. Claiming credit for someone else's work is in violation of the Academic Honesty Policy. All calculations on homework problems should be done by hand but you may, of course, check your calculations using technology. If you use technology to solve a problem, make sure you note it accordingly and hand in any printouts with your work.

To be clear, you are encouraged to share ideas, check answers, and compare solutions with classmates, but any work you submit must be "your own work" as denoted by the [Augsburg University Academic Honesty Policy](#).

That is, on any work you submit you must understand what you have written, credit the source of any ideas other than your own, and express it in your own organization, words, and notation. Direct copying is forbidden and you may not get solutions from additional texts or resources or work with people not currently in the class.

Please protect your reputation and uphold your integrity by committing to being academically honest throughout this course.

✔ **Set up a regular study schedule NOW.** To excel in this course will require 2-4 hours on text reading, homework, and study **for each MW class period**. I suggest you structure your time between re-reading any notes and the book (20% of time), preparing homework and other assignments (70% of time) and preparing for the next class period (10% of time) as a guideline.

✔ As with all Augsburg classes, you should understand and comply with all University policies including:
   o [Standards of Conduct](#)
   o [Accessibility Policy](#)
   o [Discrimination and Bias Policy](#)
   o [Sexual Misconduct Policy](#)

✔ Keep me up-to-date on how the class is going for you. Be sure to set up a meeting if you get an Academic Progress Report so that we can get you back on track.

✔ If you need disability-related accommodations to have equal access in this course, please contact the CLASS Office (Disability Resources) at class@augsburg.edu or schedule a

meeting with CLASS at www.augsburg.edu/class. If accommodations are required, the CLASS Office will notify me privately about your needs.

✔ The Augsburg [COVID-19: Resources and Procedures](#) page includes the most recent recommendations regarding COVID-19. If you are sick with COVID-19, please use the [Self-Reporting Related to COVID-19 form](#).

✔ Creating a classroom environment that welcomes and values all students is very important to me. I ask your assistance in helping support one another by following classroom rules. If you feel unwelcome or unvalued at any time, or have any suggestions for improvement, please let me know so I can try to help. Please do not be shy about telling me what is or is not working for you.

✔ Complete any in-class and online course evaluation forms.

✔ **Privacy Practices in this Course:** In order to create a classroom community built on trust, our interactions, discussions, and course activities must remain private and free from external intrusion. As a learning community, we are collectively responsible for upholding privacy protections and cultivating inquiry. We respect the individual dignity of all and will refrain from actions that diminish others' ability to learn.

✔ **FERPA**: As your instructor, I am committed to protecting your privacy by only using university-approved course technologies and adhering to the Family Educational Rights and Privacy Act ([FERPA](#)[1]). This includes using your educational data only as allowed by FERPA. I am unable to share any personally identifiable information without your written consent, except for legitimate educational purposes, or under certain conditions described above. FERPA applies to all students enrolled in this institution regardless of sex, race, color, national or ethnic origin, religious belief, age, disability, gender, sexual orientation, gender identity or expression, marital status, familial status, pregnancy, citizenship, creed, genetic information, or veteran status.

✔ **Peer to Peer Privacy:** We share a lot with each other in this class, which is why we will prioritize respect, trust, and privacy. Do not share others' personal information, names, phone numbers, emails, addresses, pictures, etc. without that individual's explicit consent. Additionally, all student work should be handled with respect and remain within interactions of this course. Do not photograph, duplicate, digitally or verbally share representations of other students' written or creative work, classroom dialogue, discussion posts, or presentations to social media or any other third party. If you have questions about this please ask me, our department chair, or school director for additional clarification.

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[1] https://www.augsburg.edu/registrar/ferpa/

DST 234 Course Calendar   Spring 2026

MDSR = [Modern Data Science with R (2ⁿᵈ edition)](#)   **DS =** Data Science by Kelleher & Tierney

Subject to further revisions as necessary throughout the semester

Week	Tuesday	Thursday
1	Jan 20 **Day 1: Introduction to Data Science** **(MDSR Ch 2, DS Ch 1)**	Jan 22 **Day 2: Is Snow Clearing Sexist?** **Basic R**
2	Jan 27* **Day 3: A Grammar for Graphics** **Basic R Plot** **(MDSR 3.1, Appendix D)**	Jan 29 **Day 4: The Structure of Data and Computation with R** **(MDSR Appendices A, B; DS Chapter 2)**
3	Feb 3 **Day 5: Visualization with ggplot & Data Intake** **(MDSR 3.1 & 6.1)** Quiz 1: Introductory Data Visualization	Feb 5 **Day 6: Who Owns Your Data?**
4	Feb 10 **Day 7: Improving Data Visualization Skills & Reproducible Workflows** **(MDSR Ch 3)**	Feb 12 **Day 8: Data Wrangling: Pipes and Data Verbs** **(MDSR Ch 4)** **Feb 14: FINAL SUBMISSION DATE FOR HOMEWORK FROM DAYS 1 -5**
5	Feb 17 **Day 9: Data Wrangling: Pipes and Data Verbs** **(MDSR Ch 4)**	Feb 19 **Day 10: Data Wrangling: Grouping & Summarizing** **(MDSR Ch 4)** Quiz 2: ggplots
6	Feb 24 **Day 11: Combining Multiple Datasets (Joins)** **(MDSR Ch 5; DS Ch 3)**	Feb 26 **Day 12: Joining and Wrangling Data** **(MDSR Ch 5)**
7	Mar 3 **No class: CAREER EXPLORATION DAY**	Mar 5 **Day 13: Pivoting Data** **(MDSR Ch 6)** **Mar 7: FINAL SUBMISSION DATE FOR HOMEWORK FROM DAYS 6 -10**
8	Mar 10 **Day 14: Working with Dates** Quiz 3: Data Wrangling & Joining	Mar 12 **Day 15: Weapons of Math Destruction** **Working with Strings**
9	Mar 17 **No class: SPRING BREAK**	Mar 19 **No class: SPRING BREAK**

Week	Tuesday	Thursday
10	Mar 24 **Day 16: Introductory Statistical Inference** **(MDSR Ch 9; DS Ch 5)**	Mar 26 **Day 17: Inference from Data** **(MDSR Ch 9)** **Mar 27: FINAL SUBMISSION DATE FOR HOMEWORK** **FROM DAYS 11 -14**
11	Mar 31** **Day 18: Causal Inference** **(DS Ch 6)** **Quiz 4: Inference**	Apr 2 **Day 19: Introduction to Maps & Maps in R** **(MDSR Ch 17)**
12	Apr 7 **Day 20: Making Maps in R**	Apr 9 **Day 21: Making Maps in R (day 2)**
13	Apr 14 **Day 22: Mapping Prejudice** **Geospatial Data & Maps** **(MDSR Ch 17)**	Apr 16 **Day 23: Functional programming and Iteration** **(MDSR Ch 7)** **Apr 18: FINAL SUBMISSION DATE FOR HOMEWORK** **FROM DAYS 15 -19**
14	Apr 21 **Day 24: Functional programming and Iteration (continued)** **(MDSR Ch 7)** **Quiz 5: Maps and their Construction**	Apr 23 **Day 25: Introduction to Machine Learning** **(MDSR Ch 11; DS Chapter 4)**
15	Apr 28 **Day 26: Introduction to Machine Learning (continued)** **(MDSR Ch 11; DS Chapter 4)** **Quiz 6: Functional programming**	Apr 30 **Day 27: Justice in Data Science** **(MDSR Ch 8; DS Ch 7)** **May 2: FINAL SUBMISSION DATE FOR HOMEWORK** **FROM DAYS 20 -25**
16	May 5 **Finals week**	May 7*** **Finals week** **2:00 PM: Final Submission Date for (1) Miniproject 5 and (2) Ethics in Data Science #6 and homework from Days 26 and 27**

* Last day to drop without a "W" grade & 100% refund (T 1/28)
** Last Day to withdraw (T 4/1)
*** Last day to designate grading option (T 5/20)