

COURSE OUTLINE

Stat 123: Data Science A01 Spring 2022 CRN: 22968

Instructor

Lecturer Chi M. Kou

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Lecture Hours: Monday, Thursday 10 - 11:20am

Lab Hour: Wednesday 3:30 - 4:20pm

Location: Check Brightspace

Lecture and Office Hour: Check Brightspace

General Course Information

Number of Units 1.5

Pre-requisites One of MATH 120, Pre-calculus 12 with a minimum grade of C+ (67%), Principles of Mathematics 12 with a minimum grade of C+ (67%), or permission of the department.

Notes: Not open for credit to students with credit in 300- or 400- level STAT course.

Cannot be counted towards the 3-unit credit limit for lower-level statistics courses.

Math Assistance

Office Hours I want you to succeed in this course and am always happy to talk to you about Stats. Regularly completing practice problems and asking questions in office hours will help you identify areas of the course that are more challenging and help you to work to better understand them.

Drop-In Help The Mathematics & Statistics Assistance Centre offers a friendly collaborative virtual study space where you can work on your 100- and 200-level math and stats courses. They also have free tutors available to help; if you are stuck on a concept or a problem, just sign up and the next tutor who supports your course will assist you. Please visit the following site for more information: <https://www.uvic.ca/science/math-statistics/current-students/undergraduate/msac/index.php>



Learning Objectives

By the end of this course, given a problem/question and some data, you will be able to write R code (a Statistical programming language) to graphically visualize and summarize the data. You will be able to interpret the graphs and summary statistics thus providing an answer to the problem/question posed.

- In the programming language R, you will be able to:
 - Load data into R.
 - Summarize the data.
 - Visualize the data.
 - Check the quality of the data.
- Given a data set, you will be able to:
 - Choose an appropriate statistical model.
 - Compute the model parameters.
 - Evaluate the fit of the model.
 - Interpret the model.

Course Materials and Online Resources

Textbook None

Reference *Statistics Concepts and Controversies* by David S Moore and William I. Notz.

Course webpage The webpage can be found at: <https://bright.uvic.ca/d21/home/156588>. All course announcements, including lecture notes, recordings, assignments, practice material and instructions for tests will be posted there. I expect you to check the site regularly. Make sure your email address is updated on Brightspace as any email announcement will be sent through there.

Statistical Software We will use the state-of-the-art statistical software, R and RStudio in this course for computations and simulations. They are available for Mac, Windows and Linux and are free to download from: <http://cran.stat.sfu.ca/> and <https://www.rstudio.com/>. We will also use R Markdown, <http://rmarkdown.rstudio.com/>, a notebook interface which weaves together narrative text and code to produce elegantly formatted output.

Class Meetings

There are three hours of lecture per week and one hour of lab, all of which are required. The lectures are on Mondays and Thursdays from 10-11:20am. The labs are on Wednesdays from 3:30-4:20pm. If you miss a scheduled lecture or lab then you are solely responsible for any in-class announcements or materials that you miss.



Evaluation and Grading

Your final percentage grade will be computed according to the following scheme.

Assignments	Lab Participation	Midterms	Final Exam
Every 2 weeks	Weekly	Feb. 7, Mar. 21	TBA
20%	15%	15% each	35%

Assignments Approximately every 2 weeks you will be given an assignment based on materials covered in lectures and labs (combining theory and practice using R). You will have one week to complete the assignment and submit it for grading. While collaboration with your peers (such as discussing questions and reviewing one another's work) is encouraged, your submitted work must be your own. Work that appears copied will be given a grade of 0.

Lab Participation Each week you will be given a worksheet in lab which will help you put concepts learned in lecture into practice using the programming language R. A specialized tutorial leader will help to guide you with a demonstration and then will give you time to work on your assigned problem. Your lab worksheet will be due by the end of the day to be graded for completeness.

Midterms There will be two midterm tests during the semester. The tests will be held on Mondays during lecture from 10am-11:20pm. The dates for these tests are Monday February 7 and Monday March 21. If you miss a test for an unavoidable reason (such as illness or family affliction), then you may be excused but you have to contact me as soon as possible. Your test mark will be assigned at the same rank as your performance on the final exam (Ex: If you rank 30th on the final then you are assigned the 30th ranked mark on the test).

If you miss both tests for an unavoidable reason then the weight will be moved to the final exam so long as the weight of the final does not exceed 60%. This will mean that there is a 5% penalty. I will contact you to explore other options.

Final Examination A 2 hour final exam will be held at the end of the term. The examination date is to be determined by the University and is usually released around the end of January. The examination period is April 11th - 29th, 2022. Students are **strongly advised not to make plans for travel or employment during the final examination period** as special arrangements will not be made for examinations that conflict with such plans.

Course Workload Each week you will have 3 hours of lecture and 1 hour of lab. To supplement the R material learned in lecture and in lab, we expect you to spend approximately 2 hours a week using DataCamp. Every second week you will be given a homework assignment which you will have one week to complete. This assignment



should take approximately 5 hours to complete. You will not be given a homework assignment on weeks where you have a test and the lab worksheets should be completed during lab. Factoring in some additional review time, or time spent in office hours or in the assistance centre, you should be spending a total of about 10 hours a week on this course.

Online Learning Student Support I recognize that many members of the UVic's community, including students, faculty and staff, have been under a lot of stress related to COVID-19. Be sure to take care of yourself and reach out for help if you are struggling. UVic Learn Anywhere page has many resources that you might find useful and supporting your well-being: <https://onlineacademiccommunity.uvic.ca/LearnAnywhere/well-being/>.

Accessibility Students with diverse learning styles and needs are welcome in this course. In particular, if you have a disability/health consideration that may require accommodations, please feel free to approach me and/or the Centre for Accessible Learning (CAL) as soon as possible. The CAL staff are available by appointment to assess specific needs, provide referrals and arrange appropriate accommodations <https://uvic.ca/cal>. The sooner you let us know your needs the quicker we can assist you in achieving your learning goals in this course.

Grading Percentage scores will be converted to letter grades according to the university-wide standard table
(Undergraduate: <http://web.uvic.ca/calendar2017-05/undergrad/info/regulations/grading.html#>).

Supplemental Examinations. The Department of Mathematics and Statistics does not award 'E' grades or offer Supplemental Examinations in any of its courses.

Policies and Ethics

Attendance The university Calendar states 'Students are expected to attend all classes in which they are enrolled.' (see <http://web.uvic.ca/calendar2017-05/undergrad/info/regulations/attendance.html#>). Our courses are conducted on that basis. If you miss an announcement (information concerning midterms, corrections to assignment, etc.) because you did not attend class, you must accept the consequences of not having learned of the change.

Guidelines on Religious Observances Where classes or examinations are scheduled on the holy days of a religion, students may notify their instructors, at least two weeks in advance, of their intention to observe the holy day(s) by absenting themselves from classes or examinations. Instructors will provide reasonable opportunities for such students to make up work or missed examinations.

Late or Missing Work If you miss a homework assignment or lab for an unavoidable reason, the weight of the missed work will be redistributed amongst the remaining works. Late assignments will be accepted for up to 24 hours with a 40% penalty. After



that, you will receive 0 for the assignment. Extension may be granted for exceptional circumstances only by your instructor.

Academic Integrity Academic integrity is intellectual honesty and responsibility for academic work that you submit individual or group work. It involves commitment to the values of honesty, trust, and responsibility. It is expected that students will respect these ethical values in all activities related to learning, teaching, research, and service. Therefore, plagiarism and other acts against academic integrity are serious academic offenses.

The responsibility of the institution

Instructors and academic units have the responsibility to ensure that standards of academic honesty are met. By doing so, the institution recognizes students for their hard work and assures them that other students do not have an unfair advantage through cheating on essays, exams, and projects.

The responsibility of the student

Plagiarism sometimes occurs due to a misunderstanding regarding the rules of academic integrity, but it is the responsibility of the student to know them. If you are unsure about the standards for citations or for referencing your sources, ask your instructor. Depending on the severity of the case, penalties include a warning, a failing grade, a record on the students transcript, or a suspension.

It is your responsibility to understand the University policy on academic integrity:

<http://web.uvic.ca/calendar2017-05/undergrad/info/regulations/academic-integrity.html#>

See Policy attachments I and II in Brightspace for more details

How to Succeed in This Course

1. Attend all lectures and labs. We will be going over many important concepts and examples in class and in your lab you will be given an opportunity to practice working with data sets and answering conceptual questions about the data.
2. To complement lectures, work practice problems from the text and any extra practice materials posted to Brightspace.
3. Complete each homework assignment and review your answers after receiving feedback.
4. When you have questions, come talk to me or visit the Math Assistance Centre (<http://www.math.uvic.ca/massist>).



The following schedule is subject to change. The chapters that we are covering from the textbook are fixed but the timeline for covering those sections and exploring those concepts in R will change depending on how long a given topic takes to adequately cover in lectures.

Course Schedule (Lecture topic dates are approximate)

Week of	Lecture	Notes
10/01/22	Course Outline, Chapter 1, R introduction	
17/01/22	Chapter 2, Samples in R	
24/01/22	Chapter 3 and 10 Visualizing Data in R	
31/01/22	Chapter 10, Review	
07/02/22	Chapter 11	Midterm 1 Monday Feb. 7
14/02/22	Chapter 12	
21/02/22		Reading Break
28/02/22	Chapter 13	
07/03/22	Chapter 13	
14/03/22	Chapter 14, Review	
21/03/22	Chapter 15	Midterm 2 Monday Mar. 21
28/03/22	Chapter 15	
04/04/22	Chapter 15	Last Day of Class Thursday April 7

