

MATH 6359: APPLIED STATISTICS AND MULTIVARIATE ANALYSIS

Spring 2024

Instructor: Dr. Cathy Poliak	Time: Fridays 1:00 – 3:00 PM
Email: cpoliak@central.uh.edu	Place: CBB 104 & TEAMS

Course Pages:

1. Tutorial for TEAMS: [Tutorial](#)
2. Canvas: [Canvas Course](#)

Office Hours: TuTh 9:30 - 11:00 AM in Flemming 11C & on [TEAMS](#), otherwise by appointment.

Main Reference: While lecture notes will serve as the main source of material for the course, the following book constitutes a great reference:

- "Statistics and Data Analysis from Elementary to Intermediate" by Tamhane, Ajit and Dunlop, Dorothy
ISBN: 0-13-744426-5
- "Applied Multivariate Statistics with R", by Daniel Zelterman, ISBN: 978-3-319-14092-6
- "Applied Multivariate Statistical Analysis, sixth edition", by Richard A. Johnson and Dean W. Wichern, published by Pearson.
- **Rstudio:** Make sure to download R and RStudio (which can't be installed without R) before the course starts. Use the link [R download](#) to download R first, then [RStudio download](#) to download it from the mirror appropriate for your platform.

Course Description: Linear models, loglinear models, hypothesis testing, sampling, modeling and testing of multivariate data, dimension reduction.

Topics Covered:

- Sampling Designs
- Experimental Studies
- Statistical Analysis
- Sampling Distributions
- Basic Hypothesis Tests
- Chi-square Tests
- Linear Regression
- Multiple Linear Regression
- Non-parametric Statistical Methods
- Multivariate Normal Distribution

- Hotelling's T^2
- MANOVA
- Discriminant Analysis
- Principal Component Analysis
- Factor Analysis

Major Assignments:

Assessment:

Labs	5%
Homework	10%
Midterm 1	30%
Midterm 2	30%
Final Group Project	25%

Labs:

- Each week there will be a Lab.
- This will be using R.
- To be turned in to Canvas under that week's module.

Homework:

- Written Assignments will be given several times during the semester. Tentatively due every two weeks.
- Students will submit their written homework by scanning and upload their work in Canvas.
- Instructions and due dates will be given on the assignment.
- The lowest written assignment will be dropped. Work not submitted will be a zero at the end of the semester.

Exams:

- The exams will be done in class.
- The tentative dates are as follows

Test	Date
Midterm 1	February 23
Midterm 2	April 12

Final Group Project

- Form a group of 3 - 5 people consisting of students teaming up in the groups in Canvas. No later than **February 10th**. With assessment at the end of semester for each team member (5 points)
- The group decides on the data set of interest, posing research questions and applying multivariate analysis techniques to address those questions. This proposal of project needs to be submitted by **March 22nd**. (10 points)
- A rough draft to show progress on your project is due on **April 5th**. (10 points)
- Each group will eventually submit a report of research findings, with some groups getting a chance (or required) to present their findings in class. Due date for final project **April 29th**. (50 points)
- **Extra Credit:** Each group will have an opportunity to present their project the last week of class, April 26th. More details to come.
- More detail and examples can be found in Canvas.

Tentative Grading Scale:

93% and above	A	at least 73% and below 77%	C
at least 90% and below 93%	A-	at least 70% and below 73%	C-
at least 87% and below 90%	B+	at least 67% and below 70%	D+
at least 83% and below 87%	B	at least 63% and below 67%	D
at least 80% and below 83%	B-	at least 60% and below 63%	D-
at least 77% and below 80%	C+	below 60%	

Excused Absence Policy:

Regular class attendance, participation, and engagement in coursework are important contributors to student success. Absences may be excused as provided in the University of Houston [Undergraduate Excused Absence Policy](#) and [Graduate Excused Absence Policy](#) for reasons including: medical illness of student or close relative, death of a close family member, legal or government proceeding that a student is obligated to attend, recognized professional and educational activities where the student is presenting, and University-sponsored activity or athletic competition. Additional policies address absences related to [military service](#), [religious holy days](#), [pregnancy and related conditions](#), and [disability](#).

Syllabus Changes:

Please note that the instructor may need to make modifications to the course syllabus. Notice of such changes will be announced as quickly as possible through UH email and Canvas course.

Academic Honesty Policy:

High ethical standards are critical to the integrity of any institution, and bear directly on the ultimate value of conferred degrees. All UH community members are expected to contribute to an atmosphere of the highest possible ethical standards. Maintaining such an atmosphere requires that any instances of academic dishonesty be recognized and addressed. The [UH Academic Honesty Policy](#) is designed to handle those instances with fairness to all parties involved: the students, the instructors, and the University itself. All students and faculty of the University of Houston are responsible for being familiar with this policy.

UH Email:

Email communications related to this course will be sent to your [UH email account](#) which each University of Houston student receives. The Exchange mail server can be accessed via Outlook, which provides a single location for organizing and managing day-to-day information, from email and calendars to contacts and task lists. Exchange email accounts can be accessed by logging into Office 365 with your Cougarnet credentials or through Access UH. They can also be configured on [IOS](#) and [Android](#) mobile devices. Additional assistance can be found at the [Get Help](#) page.

Reasonable Academic Adjustments/Auxiliary Aids:

The University of Houston is committed to providing an academic environment and educational programs that are accessible for its students. Any student with a disability who is experiencing barriers to learning, assessment or participation is encouraged to contact the Justin Dart, Jr. Student Accessibility Center (Dart Center) to learn more about academic accommodations and support that may be available to them. Students seeking academic accommodations will need to register with the Dart Center as soon as possible to ensure timely implementation of approved accommodations. Please contact the Dart Center by visiting the website: <https://uh.edu/accessibility/> calling (713) 743-5400, or emailing jdcenter@Central.UH.EDU

Mental Health and Wellness Resources:

The University of Houston has a number of resources to support students' mental health and overall well-being, including [CoogsCARE](#) and the [UH Go App](#). [UH Counseling and Psychological Services \(CAPS\)](#) offers 24/7 mental health support for all students, addressing various concerns like stress, college adjustment and sadness. CAPS provides individual and couples counseling, group therapy, workshops and connections to other support services on and off-campus. For assistance visit uh.edu/caps, call 713-743-5454, or visit a [Let's Talk](#) location in-person or virtually. Let's Talk are daily, informal confidential consultations with CAPS therapists where no appointment or paperwork is needed.

The [Student Health Center](#) offers a Psychiatry Clinic for enrolled UH students. Call 713-743-5149 during clinic hours, Monday through Friday 8 a.m. - 4:30 p.m. to schedule an appointment.

The [A.D. Bruce Religion Center](#) offers spiritual support and a variety of programs centered on well-being.

Need Support Now?

If you or someone you know is struggling or in crisis, help is available. Call CAPS crisis support 24/7 at 713-743-5454, or the National Suicide and Crisis Lifeline: call or text 988, or chat 988lifeline.org.

Title IX/Sexual Misconduct:

Per the UHS Sexual Misconduct Policy, your instructor is a "responsible employee" for reporting purposes under Title IX regulations and state law and must report incidents of sexual misconduct (sexual harassment, non-consensual sexual contact, sexual assault, sexual exploitation, sexual intimidation, intimate partner violence, or stalking) about which they become aware to the Title IX office. Please know there are places on campus where you can make a report in confidence. You can find more information about resources on the Title IX website at <https://uh.edu/equal-opportunity/title-ix-sexual-misconduct/resources/>.

Recording of Class:

Students may not record all or part of class, live-stream all or part of class, or make/distribute screen captures, without advanced written consent of the instructor. If you have or think you may have a disability such that you need to record class-related activities, please contact the [Justin Dart, Jr. Student Accessibility Center](#). If you have an accommodation to record class-related activities, those recordings may not be shared with any other student, whether in this course or not, or with any other person or on any other platform. Classes may be recorded by the instructor. Students may use instructor's recordings for their own studying

and note-taking. Instructor's recordings are not authorized to be shared with anyone without the prior written approval of the instructor. Failure to comply with requirements regarding recordings will result in a disciplinary referral to the Dean of Students Office and may result in disciplinary action.

Helpful Information:

- Coogs Care: <https://www.uh.edu/dsaes/coogscare/>
- Laptop Checkout Requests: <https://www.uh.edu/infotech/about/planning/off-campus/index.php#do-you-need-a-laptop>
- Health FAQs: <https://uh.edu/covid-19/faq/health-wellness-prevention-faqs/>
- Student Health Center: <https://uh.edu/class/english/lcc/current-students/student-health-center/index.php>