STAT GU4223/GR5223 Multivariate Statistical Inference
Syllabus – Spring 2019

Version: January 20, 2019. Syllabus is subject to change. Make sure you have the latest version. You can always find the most current version on CourseWorks.

Instructor: Dr. Banu Baydil
E-mail: bb2717@columbia.edu Imperative: Use the subject STAT GU4223/GR5223 Multivariate Statistical Inference in all your e-mails, otherwise delays in response/no response is possible. (E-mail is monitored Monday through Friday 7:30am - 8:30pm and is answered on a first come first serve basis.)

E-mails with questions whose answers can be found in the syllabus or in the sent CourseWorks announcements will not be answered individually. If multiple students ask the same question, an announcement through Courseworks will be sent in place of individual responses. You should make sure that the settings in your Courseworks account is set to receive these announcements and e-mails from Courseworks. You will not be excused for not receiving these announcements or e-mails sent through Courseworks.

Lectures: Attendance is mandatory. For lecture times, location and course description see http://www.columbia.edu/cu/bulletin/uwb/sel/STAT_Spring2019.html

Instructor office hours &location:
F 2:00pm-4:00pm (except on 02/08, 04/12, 03/15 due to a concurrent meeting I need to attend, see future announcements in class for alternate hours/dates for these dates), Watson Hall (612 W 115th St., between Broadway and Riverside) 6th floor Statistics Dept. Statistics Room 613.

Course TA: Rishabh Dudeja, rd2714@columbia.edu

Statistics Dept. MA Help Room Information: http://stat.columbia.edu/ma-programs/m-a-help-room/

Required textbook:
Applied Multivariate Statistical Analysis, 4th Edition, Wolfgang Karl Härdle, Léopold Simar, Publisher: Springer (2015), (ISBN-13) 978-3-662-45170-0 (Ordered in BookCulture and also available through Columbia Libraries Springer link)
+ Material covered in class (additional examples, topics etc. which might not necessarily be in the course textbooks).

Prerequisites: Prerequisite course sequence leading up to and including STAT GU4205(GR 5205) Linear Regression Models. If you have not completed the prerequisite course sequence leading up to and including STAT GU4205(GR 5205) Linear Regression Models (or their equivalents) successfully you should not be registered to this course, and instead take those courses first and take this course at a later semester.

Assessment measures:
1) Exams**:** Two exams (including the final) will be administered. The exams will cover material from the beginning of the semester. All material covered will have equal weight in the final exam. Some of the questions in the exams will be chosen from the exercises in the book, in homework and suggested problems and in worksheets. Exams are scored out of 100 points. Midterm exam will count towards 35% and final exam will count towards 35% of your final grade.
Exam Dates and location: Tuesday, March 12, 2019 in-class.
Final, TBD, Check Final Examination schedule later in the semester as the final exam dates and times will be announced by the registrar later in the semester. The final exam will start 15 minutes after the announced start time by the registrar and will last 2 hours.

Make-up policy for all the exams: : If you have a valid document such as a doctor's report for missing the midterm exam or an official excuse from the school, your final exam score will also count for the missed midterm exam.

Grading objections: If you object grading of certain questions in the exams, grading of the full exam will be checked. Grade objections to midterm grading can be made within the two weeks following the lecture in which the midterm exams are handed back. A word of caution: Exams might be scanned before they are given back to the students.

Taking the final exam is mandatory, and failing to do so, might lead to a failing grade.

2) Homework: There will be four HWs. Selected problems will be graded. HW will be due beginning of the lecture on the day of the deadline. Late HW will not be accepted. HW left to instructor's mailbox will also not be accepted. If you won't be able to hand in the HW in class on the due date, you can hand it in, in advance of the deadline, to the course TA, during TA office hours. If your HW is late, you are highly advised not to insist on your HW being accepted. Also requests to be excused to hand in the HW late cannot be honored. Lowest HW score will be dropped. HW total will count towards 7% of your final grade. You should make sure to have a copy of your HW for yourself before handing it in. Graded HW can be picked up from STAT GU4223/GR5223-HW Pick up Box at SSW 904 (School of social Work-9th floor), 1255 Amsterdam Ave.

3) Attendance: **Attendance is required** for the lectures. From time to time, there might be unannounced/announced in-class-work/quizzes, attendance might be taken during the lectures, and you might be asked to complete JiTT's (Just-in Time Teaching activities, each one of which is likely to take around 15-20 minutes) before or during the lectures. The total of all these participation activities will make 8% of your grade. There will be no make-ups or excused absences for missing in-class-work/quizzes/attendance or JiTT's. However, you can miss one lecture due to unexpected circumstances without penalty. Students with documented disabilities should make arrangements with ODS to take their quizzes at ODS after a quiz is administered in class. Students who distract their classmates by talking during lectures or through other means will receive 0 for attendance/participation grade.

4) Projects: You will be required to work on a project in groups during the semester. The project will contribute towards enhancing your knowledge of applying Multivariate Statistical Inference to real world problems and strengthen your understanding of important concepts. You will be working in small groups and each group will hand in a joint report on their project. The project will make 15% of your final grade. Finalized project reports are due last lecture of the semester. More information on the project will be posted later in the semester.

5) Final Letter Grade: Catalog ranges will be used. The instructor reserves the right to change the cut-offs for grade distribution based on the overall average of the class.

Use of technology in the course: CourseWorks online course system
Class announcements/e-mails will be made/sent in CourseWorks. You are expected to check CourseWorks course page regularly. A copy of the most recently updated syllabus will be on CourseWorks. Occasionally, there will be other course related handouts posted in CourseWorks. Blackboard lectures will not be posted on CourseWorks. You should NOT base your study of the material solely on the lecture notes but read the corresponding chapters/sections from the book while the material is being covered. You are responsible making sure CourseWorks announcements/e-mails are going to an e-mail you check at least once daily.

Students with disabilities: In order to receive disability accommodations, students must first be registered with Disability Services (DS). More information on the DS registration process is available online at http://health.columbia.edu/disability-services
Registered students must contact DS to arrange accommodations for this course, including exam accommodations. Students should bring an accommodation letter for signature to the professor for this course to inform the professor of

the types of accommodations they will be needing during the course. However, students do not need to have the professor/TA or the Department sign DS Testing forms for this course.
Students who have, or think they may have, a disability are invited to contact DS for a confidential discussion at 212.854.2388 (V) 212.854.2378 (TTY), or by email at disability@columbia.edu.
If you have any extenuating circumstances at any time during the course, make sure your college advisor sends an e-mail, verifying the situation, to the instructor as early as possible.

Academic dishonesty: Cheating in any form is unacceptable. Standard school policies will be enforced in the case any student is caught cheating. In addition, if you get caught cheating during an exam, you get a score of zero from that exam and are strongly encouraged to withdraw from the course. You are encouraged to check The Columbia University Undergraduate Guide to Academic Integrity at https://www.college.columbia.edu/academics/academicintegrity

Tentative Reading List Schedule: By the end of the week on the left column below, students should make sure to finish the corresponding reading (from the textbook) indicated on the right column.

Week 1, 1/21-25	Ch 2
Week 2, 1/28-2/1	Ch 2, 3
Week 3, 2/4-8	Ch 3, 4.1-4.4
Week 4, 2/11-15	Ch 4.5, 5.1-5.3
Week 5, 2/18-22	Ch 6, 7
Week 6, 2/25-3/1	Ch 7, 10
Week 7, 3/4-8	Ch 10, 11
Week 8, 3/11-15	Midterm, Ch 16
Week 9, 3/18-22	Spring Break
Week 10, 3/25-29	Ch 12
Week 11, 4/1-5	Ch 14
Week 12, 4/8-12	Ch 13
Week 13, 4/15-19	Selected topics as time permits
Week 14, 04/22-26	Selected topics as time permits, project presentations
Week 15, 04/29-05/3	Project presentations