

STAT 5208: Linear Statistical Models Fall Semester 2021

Location: OSB 0204
Time: 9:45 am – 11:00 am, Tuesdays and Thursdays
Instructor: Hongyuan Cao, Ph.D.
Email: hcao@fsu.edu
Office: OSB 0319
Office Hour: 11:00 am-12:00 pm Tue/Thur over zoom

<https://fsu.zoom.us/j/7703118512?pwd=dG8vckpDbkhQVW9KeFFlbmtvYXhscz09>

Meeting ID: 770 311 8512
Passcode: 378548

Reference: Linear Regression Analysis, 2 edition. George A.F. Seber and Alan J. Lee

Prerequisites: MAS 3105 (Linear Algebra) or equivalent, STAT 5327 (Statistical Inference) or equivalent. Students missing any of these prerequisites should consult the instructor.

Course Materials: Course materials will be put on <https://canvas.fsu.edu>. Please check for syllabus, handouts, notices, homework assignments and exam information there regularly. After you register for the course, you should be able to access course materials.

Grading*:

Homework:	30%
Midterm Exam:	30% (in-class, Thursday, Nov 4, 2021)
In class participation:	5%
Final Project:	35% (due by 5pm on Friday, Dec. 3, 2021)

* Note that incomplete grade cannot be given unless there is a serious excuse and can be approved by the statistics department.

Exams: There are one midterm exam and one final project. The exam is closed book, except that you are allowed to bring an 8.5” by 11” page of notes (both sides). All exams must be taken at scheduled times. In case you can present evidence of legitimate, unavoidable problems at least 24 hours in advance, your grades will be re-weighted. In such case, the instructor reserves the right to decide how to reweight the grades for each individual case.

Homework: Homework problems will be assigned periodically with due dates specified. When collected, homework is due at the beginning of class. Late homework will not be accepted. You are welcome to work with other students on homework problems. You must, however, write your own answers and identify your collaborators on the submitted homework. If identical copies of homework are found, all students involved will receive zero grades.

Course Objectives: The course covers a series of introductory topics in linear models. It emphasizes the underlying concepts and theory. The objective of the course is to provide the students with a firm theoretical understanding of linear models.

Intended Course Coverage:

- Linear algebra and matrix preliminaries
- Multivariate normal distribution
- Distribution of quadratic forms.
- Least square estimation and related topics
- Gauss-Markov Theorem
- Normal linear model and maximum likelihood estimation
- The Eicker-Huber-White (EHW) standard error
- The Frisch-Waugh-Lovell Theorem
- Multiple correlation coefficient
- Leverage scores and leave-one-out formula
- Model fitting, checking and misspecification
- Ridge regression
- Lasso

Course Policies

- **Classroom policies:** The classroom environment is an important factor for effective learning. In order to not distract other students' attention please follow these classroom policies. The first one of these is the university policy. Remember that no food or drinks are allowed. Turn off all audible alarms (cell phones, pagers, calculators, watches etc.) Do not use cell phones in the class. Come to the class on time.
- **Attendance:** You are required to attend all classes. The class activities will help you assimilate the lessons more easily, giving you an opportunity for active learning. Do not let this opportunity slip away. Any foreseen absence must be cleared with the instructor. If the absence is due to emergencies, it is the student's responsibility to notify the instructor at the earliest opportunity of the emergency.
- **Homework re-grade:** You have one week to request a re-grade of a homework from the date on which the graded homework is available to the students of the class. Submit a written request detailing the nature of the grading error to the instructor along with the relevant homework.

- Contacting the instructor outside the class: You are strongly encouraged to come to the instructor during the office hours. If your schedule conflicts with the office hours, you can make an appointment. You may ask the instructor brief questions by e-mail, but you may be asked to come to office hours if the instructor thinks that the questions are better answered this way. When you send e-mails remember the following: always send e-mails from your FSU accounts. The e-mails from non-FSU accounts may not reach me due to filters. Always write your full name at the end of each e-mail message you send.
- Academic honor policy: The Florida State University Academic Honor Policy outlines the University expectations for the integrity of students' academic work, the procedures for resolving alleged violations of those expectations, and the rights and responsibilities of students and faculty members throughout the process. Students are responsible for reading the Academic Honor Policy and for living up to their pledge to "... be honest and truthful and ... [to] strive for personal and institutional integrity at Florida State University." (Florida State University Academic Honor Policy)
- Students with disabilities: Students with disabilities in need of academic accommodation should: 1. Register with and provide documentation to the Student Disability Resource Center; 2. Bring a letter to the instructor indicating the type of accommodation needed. This should be done during the first week of class. See <https://dos.fsu.edu/sdrc/> for more information.