SYLLABUS | STAT 425 Fall 2021

Statistical Modeling I

Logistics

Instructor	Alexandra Chronopoulou
Email	achronop@illinois.edu
Lectures	Online (asynchronous)
Office Hours	T/Th 1pm – 2pm CST on Zoom OH Meeting ID: 879 4315 6748, Password: 425FA21 *or by appointment*
Course Website	Moodle @ `learn.illinois.edu`
Discussion Forum	Campuswire @ `campuswire.com`
Assignment Submission	Gradescope @ `gradescope.com`
TAs	ByeongJip Kim (bk20@illinois.edu) Adam Tonks (aytonks2@illinois.edu)

Course Description

- This course will mainly be focused on statistical analysis techniques using regression models. Starting from linear regression, this course will cover statistical inference for regression, regression diagnostics and remedial measures, transformations, model building and variable selection, as well as extensions such as polynomial and non-parametric regression, ridge and lasso regression.
- The course will also discuss the principles of experimental design, randomization and permutation tests, and will introduce ANOVA models (with fixed, random and mixed effects), generalized estimating equations and longitudinal data.

Course Objectives

- Understand the principles, mathematical models and methods for estimation and inference on linear models and extensions.
- Interpret models results and model diagnostics and make necessary model adjustments.
- Utilize R for the purpose of analyzing statistical data.
- Learn to communicate the results of a statistical analysis through oral and written presentations.

Textbook & References

1. *Linear Models with R* (2nd edition) by Julian Faraway.
   An earlier version of this book, Practical Regression and Anova Using R, as well as other related documentations, can be downloaded here.
2. *Extending the linear model with R* (2nd edition) by Julian Faraway.
3. *Applied Linear Regression* (4th Edition) by Sanford Weisberg.
   An earlier version can be downloaded from our Library.
4. *A Modern Approach to Regression with R*, by Simon J. Sheather.
   You can download this book (pdf) from our Library.
5. *Applied Linear Statistical Models*, McGraw-Hill, by M. H. Kutner, C. J. Nachtsheim, J. Neter, W. Li
6. *An introduction to Statistical Learning* by G. James, D. Witten,T. Hastie and R. Tibishirani.

Coursework

- Homework Assignments
  There will be 8 – 9 homework assignments throughout the semester. All homework assignments will be submitted online on `Gradescope`. **No late homework will be accepted.** The homework will account for 25% of the course grade.
- Lecture Quizzes
  There will be a short lecture quiz corresponding to each lecture. They will be submitted in `Gradescope` and will account for 5% of the course grade. The 3 lowest quiz scores will be dropped.
- Case Studies
  3-credit students: There will be 1 case study that will account for 5% of the course grade.
  4-credit students: There will be 2 case studies that will account for 10% of the course grade.

- Exams
  There will be 2 midterms, each one accounting for 25% of the course grade.
- Project
  There will be a **final project** instead of a final exam. The project will account for 10% of the course grade for 4-credit students and 15% of the course grade for 3-credit students .

Course Software

In the assignments, case studies, and project, you are *required* to use R.

Grading

Grading Scheme		
	3-credits	*4-credits*
Homework	25%	25%
Quizzes	5%	5%
Case Studies	5%	10%
Final Project	15%	10%
Exams	50%	50%

Letter Range	Percentage
A-range	90.00 – 100.00
B-range	80.00 – 89.99
C-range	70.00 – 79.99
D-range	60.00 – 69.99
F	$\leq$ 59.99

Re-grading

If you want to dispute your work's grade, all requests should be made *via Gradescope* or *by email* to the instructor *within a week after receiving your graded work*. Please note that when you ask for a question to be re-graded, the entire assignment may be re-graded.

Academic Integrity

It is expected that all students will support the idea of academic integrity and be responsible for the integrity of their work. The university has a published policy on academic integrity that may be found at `http://www.library.illinois.edu/learn/research/academicintegrity.html`

Special Accommodations

To obtain disability-related academic adjustments and/or auxiliary aids, students with disabilities must contact the course instructor and the Disability Resources and Educational Services (DRES) as soon as possible. To contact DRES, you may visit 1207 S. Oak St., Champaign, call 333-4603, e-mail disability@illinois.edu or go to the DRES website.

Family Educational Rights and Privacy Act (FERPA) Statement

Any student who has suppressed their directory information pursuant to Family Educational Rights and Privacy Act (FERPA) should self-identify to the instructor to ensure protection of the privacy of their attendance in this course. See `https://registrar.illinois.edu/academic-records/ferpa/`

for more information on FERPA.

Safety

We have been asked by public safety to share the following information in case of weather or security emergencies. Emergency Response Recommendations:
`https://police.illinois.edu/emergency-preparedness/run-hide-fight/`
Video on Emergency Response: `https://youtu.be/8j0_8PCWASE`.

Sexual Misconduct Policy and Reporting

The University of Illinois is committed to combating sexual misconduct. Faculty and staff members are required to report any instances of sexual misconduct to the University's Title IX and Disability Office. In turn, an individual with the Title IX and Disability Office will provide information about rights and options, including accommodations, support services, the campus disciplinary process, and law enforcement options. A list of the designated University employees who, as counselors, confidential advisers, and medical professionals, do not have this reporting responsibility and can maintain confidentiality, can be found here: `wecare.illinois.edu/resources/students/#confidential`. Other information about resources and reporting is available here: `wecare.illinois.edu`.

The instructor reserves the right to make any changes she considers academically advisable. Such changes, if any, will be announced via email and class announcements. It is your responsibility to keep track of the proceedings.
