Rutgers University

DEPARTMENT OF STATISTICS

STAT 583   Spring 2020

Methods of Inference
Syllabus

INSTRUCTOR
Linjun Zhang
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CLASSES MEET
01/21/2020 – 04/28/2020
Tuesdays   6:40pm – 9:30pm   HLL 116 (Busch Campus)
No class on 03/17/2020 (Spring Recess).

OFFICE HOURS
After Class: 9:30pm-10:00pm
Tuesday: 9:30am – 11:00am in Hill Center 457
TA Office Hours: to be announced.

CONTACT

- It is highly recommended and preferred that you contact the instructor and TA *in person* after class and/or during office hours.
- Your primary source for questions and answers should be the **Canvas** discussion board (see below).
- Only administrative issues and questions should be addressed to the instructor via email.

COURSE WEBSITES

Statistics 583 uses Canvas. You can gain access to **Canvas** by going to https://canvas.rutgers.edu. Materials for this course will be distributed and managed via this website, and you will be able to monitor your grade entries throughout the semester. An important feature of Canvas is the discussion panel, which is a discussion board where everybody can place questions and comments. We will be using it extensively for answering your questions about homework, quizzes, exams and scheduling.

PREREQUISITE

This course is mathematically involved. Probability theory and calculus, such as Taylor expansion, derivatives and integrals are required.

COURSE OVERVIEW

This course provides students a foundation in probability needed for statistical inference and modeling. We will cover estimation, confidence intervals, hypothesis testing, and linear regression.

COURSE MATERIALS

❖ **Textbook:** Math Stat with Applications, 7th Ed. Wackerley, et al. The course will cover Chapters 8 – 11, not necessarily in order.
❖ If the textbook is not sufficient, you may consult other books, such as "Statistics and Data Analysis from Elementary to Intermediate", by A. C. Tamhane and D. D. Dunlop, Prentice Hall, 2000.

HOMEWORK

- There will be weekly homework assignments. Homework will be assigned in class/on Canvas and will be due on Tuesday the next week. A *stapled paper copy* of your solutions needs to be handed in.
- Late homework will be penalized 15% per day for a maximum of three days. Do not ask for extensions; just hand in the homework late – scan or take pictures of your homework and email them to the TA. After three days, no credit will be given. Fraction of a day counts as a full day.
- Lowest homework grade will be dropped.
- Homework is designed to teach, and you are encouraged to seek help from the instructor/TA if you have questions. You may also work with and help each other. *You must, however, submit your own solutions, with your own write-up and in your own words. There can be no collaboration. Failure to comply will result in severe penalties.*
- Graded homework will be returned in class.
- **Missing** homework receives a score of zero and will NOT be counted as the lowest score.

QUIZZES / EXAMS

- There will be 0~2 30min quizzes.
- The midterm exam will be TBD. The room is the same as the usual classroom.
- The **final** examination will be TBD.
- During examinations strict rules will be in effect with regard to *honor code*.
- You will need a *calculator* for the exams (e.g. graphing calculator). No cell phones are allowed during the exams.

GRADING

40% homework, 20% midterm/quizzes, and 40% final examination.

TENTATIVE SCHEDULE (subject to change)

Lecture	Date		Materials	Chapters in Book	Note
1	Jan. 21st	Tuesday	Introduction; Probability Review & Preparation	7.1-7.3	
2	Jan. 28th	Tuesday	Estimation	8.1-8.4	
3	Feb. 4th	Tuesday	Confidence Intervals	8.5-8.9	
4	Feb. 11th	Tuesday	Properties of Point Estimation	9.1-9.4	
5	Feb. 18th	Tuesday	Maximal Likelihood and Asymptotics	9.5-9.8	
6	Feb. 25th	Tuesday	Hypothesis Testing: Basic concepts	10.1-10.4	
7	Mar. 3rd	Tuesday	Midterm Exam		
8	Mar. 10th	Tuesday	Hypothesis Testing: p-value and power	10.5-10.8	
9	Mar. 17th	Tuesday	No Class (Spring Recess)		
10	Mar. 24th	Tuesday	Optimal Tests	10.9-10.11	
11	Mar. 31st	Tuesday	Simple Linear Regression (SLR)	11.1-11.4	
12	Apr. 7th	Tuesday	Prediction in SLR	11.5-11.7	
13	Apr. 14th	Tuesday	Residual Diagnosis	Not in the textbook	
14	Apr. 21st	Tuesday	Final Review		
15	Apr. 28th	Tuesday	Final Exam		