Math 448- Mathematical Statistics

Syllabus

Update to the Syllabus (Posted March 16.)

Grades are posted on Blackboard.

Update 4/2

Please fill out the Remote Transition Student Survey on myCourses. It is under content.

Update 4/13

I've read through your surveys, it seems most of you find the lecture notes to be an okay substitute, if not ideal substitute for the lectures. I've afraid with the current time arrangements and other factors, I won't be able to make videos that explain things much clearer. If you would like more examples on something, I am happy to write more, but I don't want to write out more examples than necessary for the stuff you do understand.

Some you requested some videos that explain the material and I think the videos here: https://ocw.mit.edu/courses/mathematics/18-650-statistics-for-applications-fall-2016/lecture-videos/ (Lectures 7-11) are relevant. I haven't had a chance to watch them yet, but I skimmed through the slides and it looks about right. Feel free to ask me any questions about these videos.(Update 4/14: I got insomnia last night and watch the first 2.5 videos. He does a good job of explaining all the ideas and why things are done the way they are, but not too many example problems if that's what you're looking for. The order he follows is also a bit different than us, we'll discuss Power of Tests next week.)

As far, as course expectations go, you should be able to do the homework problems. Most of the problems in the book are similar, so you can also try those.

We're actually close to the end of the material. This week we discuss several more hypothesis tests, and then next week we do theoretical aspects of hypothesis tests. After that we'll just review and put everything together.

~~It seems school will be closed from 3/19 onward, the day before the second midterm is scheduled. We have covered almost all the material that will be on the exam. I think it is best to have the Midterm on 3/18, assuming campus is open that day. We can discuss this on Friday, in class, you can also email me comments. Information about the midterm is posted on blackboard.~~

On 3/13, 3/16 and ~~3/18~~, I will post lecture notes, as well as have normal lecture. From ~~3/20~~ **3/18** onward, I will just post lecture notes and be available to answer questions during the class time on Piazza. You should have gotten an email invitation to the course Piazza site.

On 3/20, there is an at-home midterm. Logistical information is posted below. Content information is already on blackboard (a previous exam is posted, you don't need to know Fisher Information)

Midterm 2 scores are now on gradescope.
The grade break-down is:
54-65 A
52-53 A-
51 B+
42-50 B
41 B-
35-40 C
34 C-

On Blackboard, under Grades, you can find your approximate grade in the course so far.

Homework:

Homework 1- Due Friday Jan. 31

Homework 2- Due Friday Feb. 7

Homework 3- Due Friday Feb. 14

Homework 4- Due Friday Feb. 21

Homework 5- Due Friday Feb. 28

Homework 6- Due Monday Mar. 9

Homework 7- Due Monday Mar. 16

Homework 8- Due Monday Mar. 30- Do problems 10.5, 10.6, 10.18, 10.20, 10.23, 10.26, 10.30, 10.32

Homework 9- Due Friday Apr. 17- Do problems 10.38, 10.39, 10.43, 10.44, 10.50, 10.52, 10.55

Homework 10- Due Friday Apr. 24- Do problems 10.65, 10.69, 10.73, 10.76, 10.79, 10.83, 10.86

Homework 11 - Due Monday May 4

In case it's not clear, I'm reading your homework on gradescope, marking that you completed in on Blackboard and then posting partial solutions/ common mistakes on Blackboard. I might mark something on your homework on gradescope but it's more likely I'll make remarks on what I post on blackboard. If you're not sure if something you did is correct, it's probably best to just ask.

Calendar:

1/22 Section 7.2

1/24 Sections 7.2

1/27 Section 7.2-.4

1/29 Section 8.2

1/31 Section 8.3-4

2/3 Section 8.4-5

2/3 Section 8.5

2/5 Section 8.6

2/7 Snow Day

2/10 Section 8.6-7

2/12 Section 8.8

2/14 Section 8.9

2/17 Section Finish Chapter 8/ Start Chapter 9

2/19 Section 9.2/9.3

2/21 Midterm 1. Information and a practice exam are posted on blackboard. Solutions are now posted. Grades: 62-75 A, 56-61 B, 48-55 C (I announced this in class wrong)

2/24 Section 9.4

2/26 Section 9.5

2/28 Section 9.4-9.5

3/2 Section 9.6

3/4 Section 9.7

3/6 Holiday

3/9 Review Consistent Estimators

3/11 Review Sufficiency and MLE

3/13 Review Sufficiency and MLE and 9.8

3/16 I discussed Example 9.15 and answered some questions from the homework. No typed notes for today, just review the homework solutions on blackboard (too be posted soon).

3/18 Classes are technically canceled. I will still be available on Piazza.

3/20- Midterm 2 Updated Midterm 2 information See top of page to grade information.

3/23 Section 10.2

3/25 Section 10.3 (Updated 3/27) Pictures added to page 3, some typos in formulas corrected on page 2.

3/27 Section 10.4

3/30 Section 10.5

4/1 Section 10.6

4/3 Section 10.7

4/4-12 Spring Break

4/13 Section 10.8 Typo at bottom of page 3, in def of T corrected.

4/15 Section 10.9

4/17 No new notes today. Review the previous notes. Let me know if you would like more examples of something.

4/20 Section 10.10 - part I

4/22 Section 10.10 - part II

4/24 ~~No new notes~~ Here is one more short note: Section 10.10 - part III

4/27 Section 10.11 - part I

4/29 Section 10.11 - part II **Note: In some of these notes I found the maximum of the likelihood function by differentiating it, instead of the log of it, like we had been doing. This is because I forgot to take the ln, both approaches give the same answer, but not taking the ln makes the computations uglier. I recommend taking the ln before taking the derivatives.**

That's all the content we're going to cover in this class. I'll write more notes if I think of something else that needs to be pointed out, or I get a request for something. I'll post some Final information soon. If you have more questions, you can email me, post on Piazza or we can set up an online meeting.

I've posted practice Final problems on blackboard. The final is this Thursday, the format will be similar to the midterm. I'll post it Thursday morning and it will be due Thursday night.

Practice Final Solutions are posted.

The Final is posted to blackboard.