SYLLABUS FOR STATISTICS 100B - LECTURE 1
INTRODUCTION TO MATHEMATICAL STATISTICS
FALL QUARTER 2019

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WWW: http://www.stat.ucla.edu/~nchristo/statistics100B/
Office hours: M 17:00-19:00, TR 14:00 - 16:00, WF 15:00-17:00

<table>
<thead>
<tr>
<th>Lecture</th>
<th>Day</th>
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<tr>
<td>Lecture 1</td>
<td>MWF</td>
<td>14:00 - 14:50</td>
<td>Public Affairs Building 1222</td>
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<tr>
<th>Section</th>
<th>Day</th>
<th>Discussion Time</th>
<th>Location</th>
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<td>1A</td>
<td>R</td>
<td>08:00 - 08:50</td>
<td>Physics and Astronomy Building 1749</td>
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<td>1B</td>
<td>R</td>
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<td>Physics and Astronomy Building 2748</td>
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Teaching Assistant: Conor Kresin.

RESOURCES:
Textbook (optional):
Handouts can be accessed at http://www.stat.ucla.edu/~nchristo/statistics100B/.
Probability and Statistics EBook (freely available at):

Software:

COURSE PREREQUISITES:
Statistics 100A, Mathematics 170A, 170E.

COURSE DESCRIPTION AND OBJECTIVES:
Statistics 100B mainly deals with parameter estimation of various distributions and models. The problem is stated as follows: Suppose $X_1, X_2, \ldots, X_n$ are i.i.d. random variables from a distribution with pdf $f(x; \theta)$, where $\theta$ is unknown. Given this sample we would like to find an estimate of the parameter $\theta$. We will also discuss properties of estimators, interval estimation, and the theory of statistical tests. Exponential families, moment generating functions, distributions related to normal ($t, \chi^2, \text{and } F$) will be discussed at the beginning of the course.

COURSE TOPICS
1. Exponential families.
3. Random vectors.
4. Joint moment generating functions for a random vector, multivariate normal distribution.
5. The central limit theorem and the law of large numbers. The distribution of the sample mean and sum of $n$ independent and identically distributed random variables.
6. The $\chi^2, t, \text{and } F$ distributions.
11. Factorization theorem.
12. Minimal sufficiency and MVUE.
13. Lehmann and Scheffé theorem.
15. Confidence intervals.

COURSE POLICIES:
Please remember to turn off cell phones. You may use electronic devices for note-taking. Students needing academic accommodations based on a disability should contact the Center for Accessible Education (CAE) at (310) 825-1501 or in person at Murphy Hall A255. For more information visit http://www.cae.ucla.edu.

ACADEMIC INTEGRITY:
You are expected to adhere to the honor code and code of conduct. As a student and member of the University community, you are here to get an education and are, therefore, expected to demonstrate integrity in your academic endeavors. All students must uphold University of California Standards of Student Conduct as administered by the Office of the Dean of Students. Students are subject to disciplinary action for several types of misconduct, including but not limited to: cheating, multiple submissions, plagiarism, prohibited collaboration, facilitating academic dishonesty, or knowingly furnishing false information. You may have assignments or projects in which you work with a partner or with a group. For example, you are welcome, and even encouraged, to work with others to solve homework problems. Even though you are working together, the assignment you submit for a grade must be in your own words, unless you receive specific instructions to the contrary. For more information about academic integrity, please go to http://www.deanofstudents.ucla.edu/.

COURSE GRADES:
There will be two evening midterm exams, a final exam, and homework that will be assigned every week. Homework will be assigned at every lecture and it will be due in 48 hours. For example, a homework assigned on Monday will be due by Wednesday of the same week before 22:00. You should expect three (3) homework per week and they will be based on material taught up to the day that the homework was assigned. Homework assignments must be uploaded before the due day/time on ccle (https://ccle.ucla.edu). Being in class on time and fully participating is important for your understanding of the material and therefore for your success in the course.

The course grade will be based on the calculation:

Final score = 0.15 × Homework + 0.25 × Midterm1 + 0.25 × Midterm2 + 0.35 × Final

COMMUNICATION:
Please keep a current e-mail address with my.ucla.edu in order to receive class announcements and reminders.

IMPORTANT DATES:
First lecture: 27 September.
Last lecture: 06 December.
Holidays: Monday, 11 November (Veterans Day), Thursday-Friday, 28-29 November (Thanksgiving).

EXAMS:
All exams are open-notes. You can use your class notes, handouts, homework, homework solutions, your statistical tables, and in general all the material posted on the course website. Make-up exams will not be given. The schedule for the exams follows:
Midterm 1: Thursday, 24 October, 18:00 - 20:00.
Midterm 2: Thursday, 14 November, 18:00 - 20:00.
Final exam: Wednesday, 11 December, 08:00 - 11:00.

Good luck!!!