Math5062: Theory of Statistics II
Spring 2014

Instructor:	Professor Nan LIN
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Time and location:	1- 2pm Monday, Wednesday and Friday, Room 199, Cupples I
Office hours:	2-3pm on Monday or by appointment.
Grader:	Chao Chang (cccc1987@math.wustl.edu)

General information

Textbook: Shao, J. (2003) *Mathematical Statistics*, 2nd edition, Springer. ISBN: 1441929789

Reference 1: Lehmann, E. L. (2008) *Testing Statistical Hypotheses*, 3rd Edition, Springer. ISBN: 0387988645.

Reference 2: Lehmann, E. L. (2004) *Elements of Large-Sample Theory*, Springer. ISBN: 0387985956.

Class webpage: All homework assignments, handouts, and other information will be available on Blackboard (http://bb.wustl.edu/). Students should check the class webpage frequently for updates.

Course Description

This course is the second half of a one-year sequence (with math5061 offered in the previous spring) that provides rigorous training in mathematical statistics for graduate students with sufficient background, and serves as a qualifying exam subject for math Ph.D. students who specialize in statistics. We will focus on the classical mathematical statistics theory of hypothesis testing, interval estimation and some nonparametric techniques. The topics include the Neyman-Pearson framework of hypothesis testing, large sample tests, nonparametric tests, U-statistics, resampling methods.

Prerequisite

Students are expected to have taken math5061 or equivalent. For example, the instructor assumes students are familiar with the following topics in probability and mathematical statistics theory: convergence in probability; convergence in distribution; law of large numbers; central limit theorem; slutzky theorem; the delta method; asymptotic normality of the MLE. There is no strict reqirement of measure theory, but it is helpful for understanding the mathematical proofs in this class. If you have questions about the prerequisites, please contact the instructor.

Computing

This is primarily a theory class and only very basic computing skill is required.

Homework, Exams and Grades

- **Homework**: There will be weekly homework assignments. No late homework will be accepted. You will receive no credits for solutions with no work or justifications. The instructor reserves the right to deduct points for messy papers. Students are encouraged to discuss homework problems with others in class, but must write your homework independently. Duplicating others' homework constitutes a violation of the university academic integrity policy. When handing in homework, you must:

- include your name (printed), course number (Math5062) on the first page.
- write legibly. You are encouraged to produce printed homework.
- staple the pages together on the upper left-hand corner to prevent pages from getting lost. Do not use paper clips.

- **Exam**: There will be one midterm and one comprehensive final exam. Both exams are closed book and closed notes. The midterm will be in class on March 5, and the final exam is on May 7 at 1-4pm.

- **Grading**: The final course grade depends on your performance on the exams and homework according to the following formula.

  Final percentage grade = 50% * Homework+ 20%* Midterm + 30% * Final exam

  The letter grade is then given according to the following scale. Cr means D or better if you elect "Credit/No Credit."

$[95, 100]$	$A+$	$[83, 85)$	$B+$	$[65, 75)$	C
$[87, 95)$	A	$[77, 83)$	B	$[60, 65)$	D
$[85, 87)$	$A-$	$[75, 77)$	$B-$	< 60	Fail

Learning Tips

1. Try to show up in all the lectures. Make good notes.

2. Ask questions in class. Your questions may be others' as well. No questions are too elementary, and all deserve to be answered.

3. Discuss with your classmates about your questions.

4. Finish homework in time.

Class Policies

1. Late homework: No late homework is accepted. If a student can not complete a homework assignment due to justifiable reasons (proofs required), such as illness or conflict with conferences, that homework grade will be dropped and the rest assignments will be reweighed. Students who miss more than two homework assignments will be given a grade of 'Incomplete', no matter for what reason.

2. Exam conflicts: Students need to contact the instructor about exam conflict at least two weeks in advance. Students who miss the final exam will receive 'Incomplete' regardless the reason.

3. Collaboration: I encourage discussion of homework in broad conceptual terms where one student tries to educate another without giving away the answer, but **all work turned in must be your own**.

4. Academic Integrity: All students are expected to adhere to the university's academic integrity policy. Any student who is found to have cheated on an assignment or exam will receive a zero score for that work, regardless of the extent of the offense.

Statement on plagiarism: The handouts used in this course are copyrighted. By "handouts," I mean all materials generated for this class including the syllabus, exams, in-class materials, and computer examples. Because these materials are copyrighted, you do not have the right to copy the handouts, unless I expressly grant the permission.