Mathematical Statistics II — Stat 7720, Section 001, Spring 2013

(Preliminary Draft)

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Classes & Rooms: TBA — In a regular semester, there are 15 weeks with about 3 weekly 50min–lectures or 2 weekly 75min–lectures, i.e., about 2250 lecture minutes in total. As my other course is a 1–credit course that will be held in a compact format during weeks 2, 3, and 4 of the semester, we have to adjust the schedule for our course accordingly. If possible, I would start with 3 (or even 4) 75min–lectures in week 1, reduce the format to just one 75min–lecture each in weeks 2, 3, and 4, and fill up with 2 or 3 75min–lectures starting in week 5. To accommodate for conferences and some other commitments on my side, there may also be weeks with no lectures at all later in the semester. To be able to accommodate your and my schedules, we may meet in an unusual way, e.g., on MTR or TRF, etc. (rather than the usual MWF or TR format). Details will be announced after the organizational meetings for both classes, based on the information from your availability sheets. Note that my other class will only meet on Mo 1/14 for the first time.

Text: *Statistical Inference* (Second Edition) by George Casella and Roger L. Berger.

This course and its prerequisite, Stat 6710/7710, will work through Casella and Berger fairly linearly. However, I reserve the right to skip around, omit some parts, or bring in some outside material. Casella and Berger will be the only textbook for this sequence although you should also check some of the books held on reserve for this course at the library. We continue where Stat 6710 ended in December 2012, i.e., with Chapter 6.

IDEA Center Learning Objectives:

Objective 1) Gaining factual knowledge (terminology, classifications, methods, trends).

Objective 2) Learning fundamental principles, generalizations, or theories.

Objective 3) Learning to apply course material (to improve thinking, problem solving, and decisions).

Objective 11) Learning to analyze and critically evaluate ideas, arguments, and points of view.

Topics:

- Convergence and Limit Theorems
- Sample Moments
- Point Estimation
- Hypothesis Testing
- Confidence Estimation
- Outlook

Course Requirements:

0) Prerequirement: Stat 6710, or knowledge similar to Casella and Berger, is highly desireable. Also valuable, but not required, are good backgrounds in linear algebra and (advanced) calculus. If you are concerned about your preparation, please contact me.

1) Class Attendance: You are responsible for all material assigned as required reading and/or presented in the lectures.

2) Lecture Notes: Lecture notes have been prepared by the instructor and have been posted on the course Web page. There exists a "blanc" and a "full" version of these notes. Please print the current chapter of the "blanc" version and bring it to class as a working copy. Download (or print) the "full" version for your use at home, but please do not bring this version to class.

3) Lecture Preparation & In–Class Presentation: Each student has to prepare and teach one 75min lecture during the course of the semester. This part is worth a total of 20% (200 points) of your course grade.

4) Homework: About 5 assignments will be handed out throughout the semester. Homework will be collected in class about two weeks thereafter (the exact due date will be stated on each homework assignment). Homework mailed in, sent by FAX, or sent by e–mail by the due date will be accepted as well. In general, late homework will not be accepted. Homework assignments are worth a total of 20% (200 points) of your course grade.

Homework assignments primarily are for training and learning purposes. What really determines your final grade are the two exams. Unfortunately, it is extremely difficult to find suitable new homework questions each semester. Therefore, almost the same set of homework questions has been used for many semesters and most new students have received the solutions from past students before working on the assignments by themselves. To account for this fact, the following policy was introduced in the Spring 2012 semester: All students will receive solutions to the homework assignments early in the semester. Before you turn in your solutions, you have to grade your assignment yourself (or swap with one of the other students) and decide whether your answer for each question (i) considerably differs from the past solutions, (ii) mildly differs from the past solutions, or (iii) is basically identical to the past solutions. You will obtain extra credit in cases (i) and (ii) and just the regular points in case (iii). So, the real challenge is to find a correct new solution that differs from the past solutions! When you turn in your homework assignment, you have to indicate one of the three options for each question. Falsely claiming (i) or (ii)

will lead to a point deduction. I will only grade questions in detail for which you selected options (i) or (ii).

You are strongly encouraged to discuss the homework assignments in small groups, but each student has to submit his/her own set of solutions.

5) Software: This course will not focus on any particular mathematical or statistical software package. You can use any statistical package you want for the homework assignments.

6) Midterm: There will be a 3–day take–home midterm exam to be handed out between TBA and TBA worth a total of 25% (250 points) of your course grade. You can decide yourself when to pick the midterm exam but you have to turn it in within 3 days (72 hours) after you have picked the exam.

7) Final: There will be an extended 4–hour in–class final on TBA worth a total of 35% (350 points) of your course grade. You will receive the same questions as the 6720 students, but also some additional PhD–level questions. **The final likely will take place before finals week.** The final will be open–book and open–note, but you are somewhat limited how much material you can bring: The only textbook you are allowed to use during the final is Casella/Berger. Your notes must be punched and fit into a folder that is at most 2 inches thick. There are no limitations what to include into this folder, i.e., lecture notes, additional handouts from class, homework questions and solutions, midterm questions and solutions, printouts from the Web, photocopies from other sources, selected material from Stat 6710, etc. Two–sided copies or reducing everything to 50% or 25% of the original size is also fine, but everything must be punched and fit into your 2 inch thick folder.

Midterm and final will consist of problems similar to those in the homework assignments. Please note that you are **NOT** allowed to discuss or share any questions or solutions with any of the other students while anyone is still working on these exams nor get any additional help from anyone else other than the instructor.

8) Americans with Disabilities Act: If a student has a disability that will likely require some accommodation by the instructor, the student must contact the instructor and document the disability through the Disability Resource Center, during the first week of the course. Any requests for special considerations relating to attendance, pedagogy, taking of examination, etc. must be discussed with and approved by the instructor. In cooperation with the Disability Resource Center, course materials can be provided in alternative formats — large print, audio, diskette or Braille.

Grading System:

Final	35%	350 pts
Midterm	25%	250 pts
Homework	20%	200 pts
Lecture	20%	200 pts
Total	100%	1000 pts

Course grades will be generally comparable (in terms of distribution) with grades assigned in other graduate statistics courses. The above schedule and procedures in this course are subject to change in the event of extenuating circumstances.