STA 7513: ADVANCED INFEREN CE II, SPRING 2020

General Information

Instructor: Victor De Oliveira
Lectures: Tue & Thu 6:00–7:15pm, BB 4.02.02
Office: BB 4.04.04
Office hours: Tue & Thu 2:30–3:30 pm or by appointment
Email: victor.deoliveira@utsa.edu
Phone: 210–4586592
Course web page: http://faculty.business.utsa.edu/vdeolive/STA7513/

Main Reference:

Additional References:
◦ E.L. Lehmann (1999), Elements of Large-Sample Theory, Springer.

Description

Brief Description. This is the second of a Ph.D. two-part course in statistical inference with emphasis on theory and foundations.

Course Outline. Different forms of stochastic convergence; laws of large numbers; central limit theorems; multivariate delta method; asymptotic properties of maximum likelihood estimators; limit distribution of estimators; tests of hypotheses; Neyman–Pearson theory; uniformly most powerful tests; unbiased tests; applications to exponential families; monotone likelihood ratio families; likelihood ratio tests; Wald tests; Rao/Score tests; asymptotic properties of tests; tests of linear hypothesis; confidence regions; duality between confidence regions and tests of hypotheses.

Prerequisites: STA 7503 or equivalent and Doctoral standing.

Details

Grading Policy & Dates. The grade for this course will be based upon four in-class exams. The grade distribution and the dates (tentative and subject to change) of exams are:

Exam 1 (25%), Thursday February 13
Exam 2 (25%), Thursday March 19
Exam 3 (25%), Tuesday April 14
Exam 4 (25%), Tuesday May 5
The final letter grade for this course will be strictly based on \( \text{TOTAL} = \text{Exam 1} + \text{Exam 2} + \text{Exam 3} + \text{Exam 4} \) according to the rule:

\[
\text{TOTAL} \geq 90\% \rightarrow \text{A}, \quad 78\% \leq \text{TOTAL} < 90\% \rightarrow \text{B}, \quad 65\% \leq \text{TOTAL} < 78\% \rightarrow \text{C}, \\
50\% \leq \text{TOTAL} < 65\% \rightarrow \text{D}, \quad \text{TOTAL} < 50\% \rightarrow \text{F}.
\]

**Exams**
- The exams will be closed-book and closed-notes. Students are allowed to bring a one-page formula sheet. You have to show all your work in the exam in order to receive credit. Each student has to write his/her own exam solution.
- Communicating with another student during the exam or looking over another student exam is considered academic dishonesty/misconduct and will be dealt with according to the UTSA policy on this regard; see below.
- There will be no individual make up exams. If you miss one of the exams, you may be allowed to take a comprehensive make up exam on May 6 (location and time to be determined). To be allowed to take this make up exam you have to bring valid written documentation that explains the reason for the missed exam. The make up exam will replace at most one missing exam grade.

**Course Mechanics**
- The lectures will follow closely the material content and order from the textbook. Some of the examples presented in class will be taken from the textbook exercises at the end of the chapters, but numerous additional examples will come from other sources.
- Every Thursday I will announce in class the topics and sections from the textbook (or other source) that will be covered the following week. The students are expected to read these and become familiar with the material before the lectures.
- To prepare for the exams and learn the material, every week you need to study the theory and examples covered that week. But this is far from enough. In addition, you need to solve as many problems as you can from the Problems section in the textbook. About 40% of these have detailed written solutions in the Appendix B of the textbook.

**Additional Information**

**Attendance.** Attendance to all lectures is mandatory as this is crucial for learning and good course performance.

**Withdraw.** The last date that a graduate student is permitted to drop an individual course with a grade of ‘W’ is March 30.

**Academic Accommodations.** The Office of Disability Services (ODS) is the only university body who may issue instructions for special academic accommodations. If you require such accommodations you have to register with ODS; see www.utsa.edu/disability/

**Academic Misconduct.** Students are responsible for learning and understanding UTSA policy on academic misconduct. The student code and related matters can be found at: https://www.utsa.edu/conduct/
The University of Texas at San Antonio Academic Honor Code

Preamble.
The University of Texas at San Antonio community of past, present and future students, faculty, staff, and administrators share a commitment to integrity and the ethical pursuit of knowledge. We honor the traditions of our university by conducting ourselves with a steadfast duty to honor, courage, and virtue in all matters both public and private. By choosing integrity and responsibility, we promote personal growth, success, and lifelong learning for the advancement of ourselves, our university, and our community.

Honor Pledge.
In support of the ideals of integrity, the students of the University of Texas at San Antonio pledge:

As a UTSA Roadrunner I live with honor and integrity

Shared responsibility.
The University of Texas at San Antonio community shares the responsibility and commitment to integrity and the ethical pursuit of knowledge and adheres to the UTSA Honor Code.

Student Creed
The University of Texas at San Antonio is a community of scholars, where integrity, excellence, inclusiveness, respect, collaboration, and innovation are fostered.
As a Roadrunner I will:

◦ Uphold the highest standards of academic and personal integrity by practicing and expecting fair and ethical conduct;
◦ Respect and accept individual differences, recognizing the inherent dignity of each person;
◦ Contribute to campus life and the larger community through my active engagement;
◦ Support the fearless exploration of dreams and ideas in the advancement of ingenuity, creativity, and discovery.

Guided by these principles now and forever, I am a Roadrunner!