STAT 5328: Intermediate Mathematical Statistics I
Fall 2015

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Office Hours: MWF 2 PM—3:00 PM Additional times available by appointment.
Website: http://www.math.ttu.edu/~lellings/5328/

Class Meetings: 12:30 – 1:50 TuTh in MATH 011
Final Exam: Friday, Dec. 4 10:30 AM – 1:00 PM

Textbook: Statistical Inference, 2nd Edition, by Casella and Berger
Prerequisites: MATH 2450 or consent of the instructor

Course Objective and Outline

The sequence STAT 5328-5329 introduces the fundamentals of the theory of mathematical statistics at the graduate level. In this course we will cover chapters 1-5 of the text: probability theory, transformations and expectations, common families of distributions, multiple random variables, and properties of a random sample.

Chapter 1: Probability Theory
Chapter 2: Transformations and Expectations
Chapter 3: Common Families of Distributions
Chapter 4: Multiple Random Variables
Chapter 5: Properties of a Random Sample

Expected Student Learning Outcomes

Students will learn the fundamentals of mathematical statistics. This includes, but is not limited to, random variables, mathematical expectation, probability density and mass functions, cumulative distribution functions, conditional distributions, special distributions, transformation of random variables, order statistics, moment generating and characteristic functions, limiting distributions, central limit theorem, stochastic convergence, properties of random samples, and basic statistics computed from random samples.

Methods of Assessing the Expected Learning Outcomes

Assessment of the learning outcomes will be achieved through in-class exams and regularly collected homework assignments.
Grades

There will be 2 midterm exams, regularly collected homework assignments and a cumulative final exam. Your numerical grade will be calculated using the following formula:

\[ \text{Grade} = 0.25(\text{Exam 1}) + 0.25(\text{Exam 2}) + 0.15(\text{Homework}) + 0.35(\text{Final Exam}) \]

The final letter grade will be assigned based on the following table. However, grade cutoffs could be made lower at the discretion of the instructor.

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<thead>
<tr>
<th>Grade</th>
<th>Percentage</th>
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<tbody>
<tr>
<td>A</td>
<td>90—100</td>
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<td>B</td>
<td>80—89</td>
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<td>C</td>
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<td>D</td>
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<td>0—59</td>
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Attendance

Attendance will not directly impact your grade. However, students are expected to attend all lectures, with the exception of excused absences. Students are responsible for all material presented and announcements made during class. Announcements for the dates of exams will be announced in-class so it is the responsibility of the student to know when assignments will be and to be prepared for them.

Exams

A total of two midterm exams will be given throughout the semester. These exams will be given during regularly scheduled lectures and the date for each will be announced at least a week in advance. The final exam will be given during the allotted period of the final examination week.

The exams will be closed-book and closed-note and are to be completed individually. Please note that your work to arrive at your answer is just as important as the answer you arrive at, if not more so. Accordingly, unless otherwise stated, you are expected to provide work and/or provide reasoning for you answer. This shows that you understand how to solve the problem as well as leaving open the opportunity to receive partial credit.

Homework

Collected homework assignments will be due every week and are to be completed individually. These problems may consist of problems from the textbook as well as problems selected by the instructor from other resources. Completed homework assignments should obey the following rule:
Your solutions should be neatly handwritten, in order, and stapled together. Working on both sides of the paper is fine. If necessary, I encourage you to either work out each problem on a separate side/piece of paper.

In order to master the material covered in the course, it is essential to work as many problems as possible. As such, a list of suggested practice problems will be provided on the course website. Many/most of these problems will not be collected, but similar problems may appear on exams. In addition to the completion of both types of problems, students are also expected to read the chapters in the textbook that correspond to the material covered in lecture. It is the responsibility of the student to keep current and it is crucial that this is done because waiting until the few nights before an exam to work through the problems will make success in the course more difficult.

Additional Resources

You may find the following textbooks as useful additional resources:
– *Mathematical Statistics with Applications*, by Wackerly, Mendenhall, and Scheaffer
– *A First Course in Probability*, by Ross
– *Probability and Statistical Inference*, by Mukhopadhyay.

Make-Ups

Late homework assignments will be accepted up to one school day after the due date and will receive a grade reduction of 20%.

Make-up exams will be available in the case of excused absences. If you know of an absence in advance, please let me know so that the make-up exam can be given in advance. Otherwise, the make-up exam must be taken within one week of the day the in-class exam. Therefore, it is critical that you be aware of exam dates and of any conflicts that may arise and schedule a time to complete the work. Once an appointment has been set to make-up an assignment, the agreed upon time will be viewed as though it is class, so missing the make-up without an excused absence will be considered the same as missing class, resulting in a score of 0.

In most cases, it is up to the discretion of the instructor what will constitute an excused absence, though they will be granted for emergencies, such as a death in the family, or treatment of an injury or illness at a medical facility. They will also be granted for absences related to University-affiliated groups, such as trips for recognized student organizations and participation in University-affiliated athletic competitions. In such cases, please inform the instructor ahead of time. In most cases, documentation is required. Finally, excused absences will be granted for observance of Religious Holidays according to the official TTU policies described below:

Absences due to Religious Observance

The Texas Tech University Catalog states that a student shall be excused from attending classes or other required activities, including examinations, for the observance of a religious holy day, including travel for that purpose. A student who intends to observe a
religious holy day should make that intention known in writing to the instructor prior to
the absence. A student who is absent from classes for the observance of a religious holy
day shall be allowed to take an examination or complete an assignment scheduled for that
day within a reasonable time after the absence.

Absences due to Officially Approved Trips

The Texas Tech University Catalog states that the person responsible for a student
missing class due to a trip should notify the instructor of the departure and return
schedule in advance of the trip. The student may not be penalized and responsible for the
material missed. Students absent because of university business will be given the same
privileges as other students.

Grade Appeals

A written statement of the grade appeals must be provided within one week of the
assignment being returned to the class. Give the instructor your work in question and a
clear, brief explanation of why you think you deserve additional credit.

Course Website

The website for this course is located at http://www.math.ttu.edu/~lellings/5328/.

Students with Disabilities

Any student who because of a disability may require special arrangements in order to
meet course requirements should contact the instructor as soon as possible to make any
necessary accommodations. Student should present appropriate verification from
AccessTECH. No requirement exists that accommodations be made prior to completion
of this approved university procedure.

Academic Integrity

Is assumed and expected at all times. Students are advised to acquaint themselves with
the Code of Student Conduct.

It is the aim of the faculty of Texas Tech University to foster a spirit of complete honesty
and a high standard of integrity. The attempt of students to present as their own any work
that they have not honestly performed is regarded by the faculty and administration as a
serious offense and renders the offenders liable to serious consequences, possibly
suspension.

Except for changes that substantially affect grading, this syllabus is intended as a
guide and is subject to change with advance notice.