Texas A&M University-Corpus Christi
Department of Mathematics and Statistics
MATH 3342.001: Applied Probability and Statistics
Fall, 2012

1 Course Information

Meeting MW 3:30-4:45, IH 164
Professor Dr. Blair Sterba-Boatwright
Office TBA (at the time of writing, it it unclear where my office will be)
Phone 361-825-2724
E-mail blair.sterbaboatwright@tamucc.edu
ClassURL bb9.tamucc.edu
Office Hrs MW 12-1:30 pm; T 3-6 pm; other times by appointment.

2 Course Description

This is an introduction to statistical methods. Emphasis is placed on interpretation and understanding of statistical concepts. A computer statistical package will be used to work with real data. Students use data analysis to learn and detect patterns and structure in data. They explore the basic concepts of statistics such as discrete and continuous distributions, numerical summary measures, probability, sampling distributions, fitting a line to bivariate data, estimation, confidence intervals and hypothesis testing.

3 Prerequisites

MATH 2413, Calculus I, or the equivalent.

4 Text and Other Supplies

Text Devore, Jay L., Probability and Statistics for Engineering and the Sciences, 8th edition. Although this is listed as “Required”, I will discuss in class the extent to which you really need this.

Software Since pretty much everyone has access to Excel, many of you are familiar with it, and you can do what you need with Excel, occasionally with extra work, I’ve decided to use Excel as our software tool. Be aware, though, that Excel has well-documented flaws as a statistical tool (see http://www.practicalstats.com/xlsstats/excelstats.html for a list of some).

Calculator You will need one. No specific calculator is required, but many students have found that the TI graphing calculators are helpful at various points in the course. I am not an expert on the differences between the TI 8X-9X calculators. If you are contemplating buying one, go online at <education.ti.com> and download the pdf manual for the one you are contemplating. For it to do you good, it should have the following built-in functions: binomcdf and binompdf, poissoncdf and poissonpdf, normcdf and invnorm, tcdf and invT.
5 Student Learning Outcomes

At the end of this course, students will be able to:

- Perform elementary probability calculations
- List important statistical distributions, both discrete and continuous, along with common uses of each in modeling settings
- Explain the relationship between probability, sampling distributions, and inferential statistics such as confidence intervals and hypothesis tests
- Explain the advantages and disadvantages of using parametric probability models and of using bootstrap methods to estimate sampling distributions, and justify why one or the other choice might be better in a given situation
- Construct confidence intervals for unknown parameters using bootstrap and parametric methods
- Perform hypothesis tests for unknown parameters using bootstrap and parametric methods
- Choose among the various inferential statistical methods from this course to answer specific research questions
- Display data graphically in an appropriate way
- Interpret and write up appropriately the results of statistical calculations to answer research questions

6 Instructional Methods and Activities

Classroom meetings will be primarily lecture, with some demonstrations and in-class problem solving. There will substantial homework and computer assignments.

7 Evaluation and Grade Assignment

Homework/Quizzes My intent is to assign homework weekly to turn in. However, this assumes I am permitted to hire a HW grader and that I can find one. If I am unable to get a HW grader, I will give weekly in-class quizzes instead. However this works out, it’ll be worth 25% of your grade.

Tests There will be three in-class mid-semester tests, worth 15% each. The tests are currently scheduled for: Wednesday, Sept. 19; Wednesday, Oct. 17; and Wednesday, Nov. 14.

Final The Final Exam is worth 30%. The Final Exam will be Wednesday, Dec. 12, 1:45-4:15.

From these evaluations, your grade will be computed using the standard scale: A = 90-100; B = 80-89; C = 70-79; D = 60-69; F = below 60

8 Tentative Course Schedule

- Weeks 1: Introduction to the course; the nature of data; samples; remedial discrete math
- Weeks 2-3: Probability (Chapter 2)
- Week 3-4: Discrete Random Variables (Chapter 3)
- Weeks 4-5: Test 1; Chapter 3 and Continuous Random Variables (Chapter 4)
- Week 6: Continuous Random Variables (Chapter 4)
• Week 7: Data Exploration & Software & Simulation (Chapter 1)
• Week 8: Sampling Distributions & the Bootstrap (Chapter 5); Test 2
• Week 9: Sampling Distributions & Parametric Models (Chapter 5)
• Weeks 10-11: Confidence Intervals (Chapter 7)
• Weeks 11-12: Hypothesis Testing I: Single Means (Chapter 8); Test 3
• Week 13: Hypothesis Testing II: Comparing Two Means (Chapter 9)
• Week 14: Hypothesis Testing III: Comparing Multiple Means (Chapter 10)
• Week 15: Correlation and Regression
• Week 16: Review for final (this is just one day)

9 Class Policies

• TIMELINESS: It is your responsibility to keep track of course deadlines and due dates. In particular:
  
  – Homework assignments show up on Blackboard; I also announce due dates in class. “I didn’t know it was due” is not a valid excuse.
  
  – If you are unable to attend a test and you wish to make it up, I need to hear from you no later than 24 hours after the missed test. You should be able to provide adequate documentation of why your absence was necessary. If you wait more than 24 hours to contact me, you will also need to provide adequate documentation of why you were unable to meet the 24-hour deadline. As an example, “I was called out of town unexpectedly on business” might be a valid reason to miss a test, but it is not an adequate reason to miss the 24-hour notification requirement.
  
  – The end of the semester is a busy time for me as well as you, and I do not have time to proctor final exams outside the assigned schedule. Please do not approach me with stories of non-refundable plane tickets, asking for a separate exam time. The exam schedule for this semester was posted in plenty of time for you to make the correct flight arrangements. I will only consider alternate exam times if either (i) you have three finals scheduled for the same day and invoke the University’s rule allowing you to reschedule one of them; or (ii) you have a legitimate academic or professional conflict with the scheduled time. If one of these situations applies to you, please give me adequate notice to work out an alternate time.
  
• A grade of I (Incomplete) will only be given in exceptional circumstances, such as a death in the family or personal injury that might prevent someone from taking the final test. In this case, it is the responsibility of the student to notify me as soon as possible, preferably by e-mail, and to complete the required "Incomplete Form" available from the University Registrar. If this is not done, a score of 0% will be assigned for any incomplete tests and a final grade will be computed using the criteria described above.

• University students are expected to conduct themselves in accordance with the highest standards of academic honesty. Academic misconduct for which a student is subject to penalty includes all forms of cheating, such as illicit possession of examinations or examination materials, falsification, forgery, complicity or plagiarism. (Plagiarism is the presentation of the work of another as one’s own work.) In this class, academic misconduct or complicity in an act of academic misconduct on an assignment or test will result in a grade of 0% on that assignment or test.

• Although obviously I hope all goes smoothly for you this semester, events can sometimes occur that make dropping a course necessary or wise. I encourage you to consult with me before you decide to drop to be sure it is the best thing to do. Should dropping the course be the best course of action, you must initiate the process to drop the course by going to the Student Services Center and filling
out a course drop form. Just stopping attendance and participation WILL NOT automatically result in your being dropped from the class. Friday, Nov. 2, is the last day to drop a class with an automatic grade of “W” this term.

10 University Statements

Grade Appeals

As stated in University Rule 13.02.99.C2, Student Grade Appeals, a student who believes that he or she has not been held to appropriate academic standards as outlined in the class syllabus, equitable evaluation procedures, or appropriate grading, may appeal the final grade given in the course. The burden of proof is upon the student to demonstrate the appropriateness of the appeal. A student with a complaint about a grade is encouraged to first discuss the matter with the instructor. For complete details, including the responsibilities of the parties involved in the process and the number of days allowed for completing the steps in the process, see University Rule 13.02.99.C2, Student Grade Appeals, and University Procedure 13.02.99.C2.01, Student Grade Appeal Procedures. These documents are accessible through the University Rules Web site at http://www.tamucc.edu/provost/university_rules/index.html For assistance and/or guidance in the grade appeal process, students may contact the Office of Student Affairs at (361) 825-2612, by e-mail at student.affairs@tamucc.edu or in person at UC 318.

Disability Accomodation

The Americans with Disabilities Act (ADA) is a federal anti-discrimination statute that provides comprehensive civil rights protection for persons with disabilities. Among other things, this legislation requires that all students with disabilities be guaranteed a learning environment that provides for reasonable accommodation of their disabilities. If you believe you have a disability requiring an accommodation, please call or visit Disability Services at (361) 825-5816 in Corpus Christi Hall, Room 116.

If you are a returning veteran and are experiencing cognitive and/or physical access issues in the classroom or on campus, please contact the Disability Services office for assistance at (361) 825-5816.

Classroom/Professional Behavior

Texas A&M University-Corpus Christi, as an academic community, requires that each individual respect the needs of others to study and learn in a peaceful atmosphere. Under Article III of the Student Code of Conduct, classroom behavior that interferes with either (a) the instructor’s ability to conduct the class or (b) the ability of other students to profit from the instructional program may be considered a breach of the peace and is subject to disciplinary sanction outlined in article VII of the Student Code of Conduct. Students engaging in unacceptable behavior may be instructed to leave the classroom. This prohibition applies to all instructional forums, including classrooms, electronic classrooms, labs, discussion groups, field trips, etc.