Course Description and Objectives

The application of statistical and quantitative methods. Topics that we will address include: hypothesis testing, analysis of variance (ANOVA), and linear regression. Students successfully completing this course should be able to:

1. Use quantitative, abstract, and logical reasoning;
2. Obtain basic knowledge in mathematics and statistics;
3. Acquire skills in the use of contemporary information resources and technology;
4. Utilize analytical thinking, critical analysis, logic, creativity, and integrative problem solving;
5. Work with descriptive statistics in a sampling situation;
6. Perform a variety of statistical tests and make inferences;
7. Compute and interpret regression equations using raw data;
8. Use standard tables for the normal distribution, t-distribution, and f-distribution;
9. Use Microsoft Excel to perform data analysis.

You may have heard from your friends that Statistics is boring and difficult. Your friends are right, but that doesn't mean that you can't have fun learning this very important subject.

Prerequisites

MTH 220

Class Meetings

Mondays and Wednesdays, 2:30-3:45 in BU 121.

Text and Other Materials

The textbook we will use is Basic Business Statistics, 13th Edition by Berenson, Levine, and Szabat, 2015, Pearson. The required supplement is MyStatLab. Access to MyStatLab is required for this course – that is where you will complete all of the homework assignments. To register, follow these instructions.

We will also use Excel rather extensively, so you should make sure you are familiar with its basic functions. **PLEASE DO NOT USE A MAC FOR EXCEL IN THIS CLASS**; whenever possible, use a PC. There are some features of Excel that simply do not work on Macs without add-ons that you would have to purchase. Also, this is a course in business statistics, which is designed to prepare you to use statistics in a business setting – i.e., workplace – where you will most certainly need to work with PCs and not Macs.

This syllabus along with other class materials is available on Desire2Learn (D2L).
Grading

Your course grade will be computed as follows:

<table>
<thead>
<tr>
<th>Component</th>
<th>Weightage</th>
</tr>
</thead>
<tbody>
<tr>
<td>Four Exams (15% each)</td>
<td>60%</td>
</tr>
<tr>
<td>Homework</td>
<td>15%</td>
</tr>
<tr>
<td>Quizzes</td>
<td>10%</td>
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<tr>
<td>Critical Thinking/Excel Exercises</td>
<td>10%</td>
</tr>
<tr>
<td>Attendance and Class Participation</td>
<td>5%</td>
</tr>
<tr>
<td>(Optional) Cumulative Final</td>
<td>30%</td>
</tr>
<tr>
<td><strong>Total</strong></td>
<td><strong>100%</strong></td>
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Letter grades will be assigned according to the following scale: 90%-100% → A; 80% - 89% → B; 70% - 79% → C; 60% - 69% → D; < 60% → F.

Your overall course average will be rounded up to the nearest integer, but no other curving will be done. In other words, a 88.3 average will be rounded up to a 89 and correspond to a B.

Exams

There will be four equally-weighted noncumulative exams; they will be held in class on pre-determined dates (see schedule below). The dates will not be changed under any circumstances, short of a natural disaster, an act of God, or the University canceling classes that day. While the four exams are not cumulative, everything in Statistics is comprehensive in nature, so to do well on the last exam – which only covers the last portion of the course, you will need to have mastered the earlier material as well.

On the days of exams, we will meet in the lab, BU 314, and you will complete the exam online.

Makeup exams will only be given in extraordinary circumstances and only if you notify me prior to missing an exam. I reserve the right to determine whether your excuse for missing it warrants a makeup.

An optional cumulative Final Exam will be held during finals week. It will consist of problems (not multiple choice questions), be in the traditional pen-and-paper format, and will replace two of the lowest exam grades.

Homework Assignments and Quizzes

There will be eight (8) major topics covered, each with a corresponding homework assignment and a quiz to be completed on MyStatLab.

You should take care of buying access to MyStatLab ASAP. If you run into technical difficulties, contact their technical support, they are very good about responding quickly. But don't delay this; there are assignments due early on in the term, and they will count. Note that you can use MyStatLab for up to two weeks before paying for it.

Homeworks

You will have four attempts at each assignment before the due date (the night before the next exam). The attempts are not timed; you can also save your progress on an assignment and come back to it later. Submitting an assignment for grading counts as a “take.” Homework assignments allow you to use helpful tools, such as seeing a similar question worked out or hints; Quizzes described below do not provide this assistance – in that sense, they are good preparations for Exams. Late homework submissions (after the due date) will be penalized 20 percent. Each assignment will be available for exactly one week (7 days) past the due date; you can submit the assignment during this period and incur the late penalty. No submissions will be allowed after this one-week period.

Quizzes

Quizzes are short, five-question mini-tests and are to be completed on MyStatLab. They are the single best way to prepare for the exams. You will have three attempts to complete each quiz, and your highest score will be recorded. There is a one-hour time limit for each quiz attempt (though, with only five questions, this limit should never be binding.) The questions on the quiz are randomly chosen from a larger database of questions, so repeated attempts will not necessarily show the same questions. Unlike homework assignments, quizzes do not allow you to use helpful tools. Some of the
quiz questions will provide the basis for exam questions. All quizzes and homework assignments are due at 11:59 pm on the specified due date. Quizzes cannot be submitted after this point or made up.

**Critical Thinking Assignments and Applications**

There will be four (4) Critical Thinking Assignments, approximately in weeks 2, 6, 10, and 15. Each will be available for exactly one week. Detailed instructions will be provided, but the goal of each assignment is to assess how you apply statistical techniques learned up to that point in the class.

**Extra Credit**

There are several opportunities to earn up to 10 additional points that can be added to any exam score. To take advantage of these opportunities, pick a mini-project from those available (see D2L) and complete it. You are allowed to complete multiple projects, but they are the only extra-credit available, so don’t ask for others.

**House Rules**

1. Come to class, be on time and participate. And silence your phone!
2. Ask questions, even the ones you think are dumb. Do it when you have them; don’t wait until the end of the term to figure out an issue addressed weeks before.
3. Get yourself a calculator. Using your phone in class is fine, but not on the exams. A graphing or a financial calculator is not necessary, but if you have one already, use it. Otherwise, one with the four basic operations that also takes the square root should be fine.
4. Don’t ask me when the next exam is or what your grade is in the class so far — the schedule is easily accessible and calculating your average is not that hard.

**Class Schedule**

The exams will be held as follows:

- **Exam 1**: Wednesday, February 14, 2018
- **Exam 2**: Wednesday, March 7, 2017
- **Exam 3**: Wednesday, April 4, 2018
- **Exam 4**: Wednesday, May 2, 2018
- **Optional Final Exam**: TBD*

* The official scheduled time for our Final is Friday, May 11th at 10:30 am, but we will make an adjustment at some point during the semester.

**Introduction and Review**

- **Week 1**: Normal Distribution (Sec. 6.1-6.2)
- **Week 2**: Sampling Distribution of \( \bar{X} \) (Sec. 7.1-7.2)

**Hypothesis Testing (one sample)**

- **Weeks 3-4**: The Hypotheses, the Errors, and the two approaches to testing (Sec. 9.1-9.3)

**Hypothesis Testing (two samples)**

- **Weeks 5-6**: Pooled variances and unequal variances \( t \)-tests, and \( z \)-tests for independent samples (Sec. 10.1)

**Analysis of Variance Tests**

- **Weeks 7-8**: ANOVA (Sec. 11.1, 11.3)

**SPRING BREAK**

- **Week 9**

**Linear Regression**

- **Weeks 10-11**: Simple Linear Regression and Correlation (Chapter 13)
- **Weeks 12-13**: Multiple Regression and Correlation (Chapter 14)
- **Week 14**: Additional issues: Dummy Variables, Multicollinearity

**Model Building**

- **Week 15**: Polynomials; Exponential, and Multiplicative Models, etc. (Chapter 15)
Program Learning Outcomes:
Program learning outcomes define the knowledge, skills, and abilities students are expected to demonstrate upon completion of an academic program. These learning outcomes are regularly assessed to determine student learning and to evaluate overall program effectiveness. You may access the program learning outcomes for your major and particular courses at http://www.sfasu.edu/cob/ug-plo.asp.

General Student Policies:

Academic Integrity (4.1)
Academic integrity is a responsibility of all university faculty and students. Faculty members promote academic integrity in multiple ways including instruction on the components of academic honesty, as well as abiding by university policy on penalties for cheating and plagiarism.

Definition of Academic Dishonesty:
Academic dishonesty includes both cheating and plagiarism. Cheating includes but is not limited to (1) using or attempting to use unauthorized materials to aid in achieving a better grade on a component of a class; (2) the falsification or invention of any information, including citations, on an assigned exercise; and/or (3) helping or attempting to help another in an act of cheating or plagiarism. Plagiarism is presenting the words or ideas of another person as if they were your own. Examples of plagiarism are (1) submitting an assignment as if it were one's own work when, in fact, it is at least partly the work of another; (2) submitting a work that has been purchased or otherwise obtained from an Internet source or another source; and (3) incorporating the words or ideas of an author into one's paper without giving the author due credit. Please read the complete policy at http://www.sfasu.edu/policies/academic_integrity.asp.

Withheld Grades Semester Grades Policy (5.5)
Ordinarily, at the discretion of the instructor of record and with the approval of the academic chair/director, a grade of WH will be assigned only if the student cannot complete the course work because of unavoidable circumstances. Students must complete the work within one calendar year from the end of the semester in which they receive a WH, or the grade automatically becomes an F. If students register for the same course in future terms the WH will automatically become an F and will be counted as a repeated course for the purpose of computing the grade point average.

Students with Disabilities
To obtain disability related accommodations, alternate formats and/or auxiliary aids, students with disabilities must contact the Office of Disability Services (ODS), Human Services Building, and Room 325, 468-3004 / 468-1004 (TDD) as early as possible in the semester. Once verified, ODS will notify the course instructor and outline the accommodation and/or auxiliary aids to be provided. Failure to request services in a timely manner may delay your accommodations. For additional information, go to http://www.sfasu.edu/disabilityservices/.

Acceptable Student Behavior
Classroom behavior should not interfere with the instructor's ability to conduct the class or the ability of other students to learn from the instructional program (see the Student Conduct Code, policy 10-4). Unacceptable or disruptive behavior will not be tolerated. Students who disrupt the learning environment may be asked to leave class and may be subject to judicial, academic, or other penalties. This prohibition applies to all instructional forums, including electronic, classroom, labs, discussion groups, field trips, etc. The instructor shall have full discretion over what behavior is appropriate/inappropriate in the classroom. Students who do not attend class regularly or who perform poorly on class projects/exams may be referred to the Early Alert Program. This program provides students with recommendations for resources or other assistance that is available to help SFA students succeed.