Course Module
Stephen F. Austin State University
STA 320-001 Statistical Methods
M 206 12:30-1:45PM TR

Instructor
Robert (Bob) Henderson
Department: Mathematics & Statistics; Office: M 344
E-mail: hendersork@sfasu.edu
Phone: Office: (936) 468-1540; Cell: (936) 615-7796
BA in Math & History – Trinity University, San Antonio, TX (1978)
MS in Mathematical Statistics – Southern Methodist University, Dallas, TX (1980)
PhD in Mathematical Statistics – Southern Methodist University, Dallas, TX (1982)
MBA – University of Delaware, Newark, DE (1988)
Worked in industry for 27 years: ~6 years with DuPont as internal consultant for a variety of businesses and staff groups; then ~21 years in the semiconductor business, most with a supplier of a key enabling material for semiconductor production; and later with Samsung working primarily with engineers in process control efforts. The entire 27 years included many training delivery, as well as course development activities related to basic statistics, experimental design, and process control systems. Have taught at SFA since the fall of 2009.

Teaching Hours – 9-11:50AM MWF, 12:30-1:45PM and 3:30-4:45PM TR
Office Hours – M 2-3:30PM, TR 10:30AM-12:00PM, W 2-5PM, and by appointment

Course Goals
This course is an extension of MTH 220, and is designed to be a broad overview of a variety of statistical methods that expand on the relatively elementary concepts introduced in MTH 220. The course will begin with a review of two-sample inference. The concepts of correlation and regression will be expanded upon to include inferential procedures. The course will also cover extensions of inferential procedures to evaluating means and proportions for more than two groups, as well as briefly describe some simple nonparametric methods and routinely and widely applied quality control approaches. The goal of the course is to introduce the student to a breadth of statistical tools, outlining the situations when each might be appropriate to utilize, and improve the student’s statistical literacy.

Text

Computer Access/Skills
While much of the work can be accomplished using the capabilities of Microsoft Office products (eg, Excel, Word, Powerpoint), there will be opportunities to use the JMP statistical software package, which can be obtained by students via a link in MySFA, and is also available on most of the computers in the 3rd floor labs.

Prerequisites
Students will be expected to have successfully completed MTH 220, and be familiar with most of the material in the first eight (8) chapters of the text.
Course Rationale
Data surrounds us from all media: radio, TV computer, etc. Data can be collected, summarized, and interpreted as statistics. Decisions are often based on data and statistical summarizations of data. To help us better understand and live in our world, it is helpful to know something about statistics.

Across the domains of human knowledge, information is becoming more quantitative. A basic understanding of statistics is necessary to make some sense out of all the data. The use of statistics has increased in the workplace. Market research, analysis of business trends, manufacturing, and quality assurance all make use of statistical analysis. Statistics are also used both correctly and incorrectly in matters of political and public debate to achieve desired results without deliberately falsifying the data.

The course is designed to introduce an array of statistical methodology that might be encountered in any of the above situations or others. It is hoped that with this knowledge, the student will have some appreciation for how to critically evaluate the actual information conveyed by these types of statistical analyses.

Course Overview

Week 1-3: Two Sample Inference
Weeks 4-6: Correlation and Regression
Weeks 7-8: Goodness-of-Fit and Contingency Tables
Weeks 9-10: Analysis of Variance
Weeks 11-12: Nonparametric Statistics
Weeks 13-15: Statistical Process Control

Course Student Learning Objectives
By completing and performing well on homework and projects, students will demonstrate their knowledge of and be able to:

1. Identify and make inferences concerning the differences in proportions across two or more groups
2. Identify and make inferences concerning location differences among two or more samples
3. Identify and make inferences related to the correlation between two variables
4. Identify and make inferences concerning simple and multiple linear regression models
5. Understand and utilize commonly applied industrial quality control methods
6. Effectively and clearly communicate objectives, analyses, results, and conclusions when using data to evaluate specific problems

Departmental Course Syllabus Link:
http://www2.sfasu.edu/math/courses/syllabi/STA320Syllabus.pdf

About Assignments
In preparing assignments, please be sure to include your name at the top of each page. The problems should be in order with all work shown. Since many of the solutions are recorded in the back of the text, no credit will be given for the correct answer when no work is shown. Since the grading will primarily be focused on the steps used to reach a final solution, neatness will count. If the steps cannot be
followed, or it is unclear how a specific step is reached in a given problem solution, then points will be lost.

A selection of the problems in the book will be assigned for homework, but only 1 or 2 chosen at random will be evaluated for each homework result. There will be approximately 6 homework assignments, and your best 5 scores will be used in the calculation of the homework grade.

There will be approximately 6 projects assigned throughout the course. These may be completed individually or in groups of no more than 3 students. If completed as a group, everyone in the group will receive the same score on the project. At least three of the six projects will need to be prepared to be presented in class. The best 5 of the project scores will be used in the calculation of the project grade.

**Grading**

Final grade will be determined based on the following proportions:

<table>
<thead>
<tr>
<th>Component</th>
<th>Percentage</th>
</tr>
</thead>
<tbody>
<tr>
<td>Homework</td>
<td>30%</td>
</tr>
<tr>
<td>Projects</td>
<td>50%</td>
</tr>
<tr>
<td>Final Exam</td>
<td>20%</td>
</tr>
</tbody>
</table>

**Attendance**

Attendance is not mandatory; however, when projects are presented in class, feedback from those not presenting will be solicited and contribute to each individual’s own project score for that project. As a result, not attending these classes will result in lower project scores for those choosing not to attend class presentations.

It would also be prudent to attend on days when homework is due since the policy is to not accept late homework. If you know you are going to miss such a class, arrange to have a classmate turn in your homework, or otherwise arrange to get it to me prior to the appropriate class.

**Academic Integrity**

It is the responsibility of the student to abstain from cheating. Dishonesty of any kind with respect to examinations, written assignments [completed] in or out of class, alteration of records, or illegal possession of current examinations or keys to examinations shall be considered cheating. Courtesy and honesty require that any ideas or materials borrowed from another must be fully acknowledged. Offering the work of another as one’s own is plagiarism. The subject matter of ideas thus taken from another may range from a few sentences or paragraphs to entire articles copied from books, periodicals, or the writing of other students. The offering of materials assembled or collected by others in the form of projects or collections without acknowledgment is also considered plagiarism. Any student who fails to give credit for ideas or materials taken from another is guilty of 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. (from SFA on-line Student Handbook)

A full description of university procedures and penalties in response to cheating and plagiarism can be found in the on-line Student Handbook in the Academic Integrity section at http://www.sfasu.edu/policies/academic_integrity.asp.

All of the above is the official policy of the school; however, the ultimate defender of academic integrity is each individual student. In this class, it might be helpful to work in small groups on the problems. Sharing ideas and helping each other with approaches to understand and solve the problems is not considered cheating or plagiarism. Copying someone else’s homework results 10 minutes before class is considered to be cheating (be warned that these situations are generally easy to identify, and both parties will be subject to the respective penalties). You are encouraged to discuss the problems with others outside the classroom, but you are all considered adults, and until you provide evidence to the contrary, will be relied upon to set appropriate boundaries in how you work with others through the duration of this class.

**Withheld Grades**
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**
In accordance with University policy, students with disabilities who need accommodations are expected to initiate a meeting with the professor immediately upon registering with Disability Services to discuss how accommodations included on the Special Accommodation Request form will be provided. Students with disabilities who may have special needs and have not requested support services should seek assistance through Disability Services. The Office of Disability Services (ODS) is located in the Human Services Building, room 325, and can be contacted by phone at 468-3004 / 468-1004 (TDD). Failure to request services in a timely manner may delay appropriate 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 D-34.1). 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.