STT 2810 - Introduction to Statistical Inference and Data Analysis  
Spring 2004

Instructor:  Dr. Jose Almer T. Sanqui  
Walker Hall Room 226  
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sanquijat@appstate.edu

Office Hours: All students are encouraged to see the instructor at his office Monday 11:00-12:00 and 2:00 – 4:00, Tuesday 2:00-4:00, Wednesday 11:00-12:00 and 1:00-4:00, and Friday 11:00-12:00. Those who are not available during these times may set-up an appointment for other times. These office hours are free of charge so take advantage.

Meeting Times: 12:00 – 12:50 MWF @ WA304


Course Description: This is an introductory course to the art and science of Statistics and Data Analysis which covers basic (but powerful) tools and methodologies for dealing with all sorts of data. Emphasis is on conceptual understanding and interpretation of results rather than theoretical development. The course also includes an introduction to the statistical software Minitab.

General Course Objectives: At the end of the course, the students are expected to
• gain an appreciation of the various applications of Statistics
• demonstrate understanding of statistical concepts
• apply basic statistical methodologies and data analysis tools
• perform basic statistical procedures using the software Minitab

Class Policies:
• Attendance will be taken every meeting
• Absent students are responsible for all materials covered in class including handouts, announcements and assignments
• No make-up will be given for missed quizzes, homeworks and exams unless absence is due to illness or family emergencies corroborated with proper documents
• Homeworks will be assigned and collected regularly
• Quizzes will be given regularly based on the assigned homeworks and lectures
• Strictly no checking of e-mails and web-surfing during computer lab class
• Strictly no food, drinks and/or tobacco in the computer lab
• As a courtesy to everyone, please come to class on time and all beepers and cell phones must be turned off during class
• All forms of academic dishonesty will be dealt with immediately and strictly according to established policies (see www.academiaffairs.appstate.edu/academic_integrity_code.htm)
• Jokes are allowed but only if it is statistical ☺
Grading Policy: Grades will be based on the following:

<table>
<thead>
<tr>
<th>Component</th>
<th>Percentage</th>
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<tbody>
<tr>
<td>3 Exams</td>
<td>45%</td>
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<tr>
<td>Final Exam</td>
<td>25%</td>
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<tr>
<td>Homeworks</td>
<td>10%</td>
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<tr>
<td>Quizzes</td>
<td>10%</td>
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<tr>
<td>Report</td>
<td>10%</td>
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<td><strong>TOTAL</strong></td>
<td><strong>100%</strong></td>
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Exams: These are in-class exams largely based on the following Chapters in the textbook.

<table>
<thead>
<tr>
<th>Exam</th>
<th>Chapter</th>
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<tbody>
<tr>
<td>Exam 1</td>
<td>Chapter 1</td>
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<tr>
<td>Exam 2</td>
<td>Chapter 2 and Chapter 3</td>
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<tr>
<td>Exam 3</td>
<td>Chapter 4 and Chapter 5</td>
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These exams are a mixture of multiple-choice type questions, short answer type questions, true or false type questions, essay-type questions and problem-solving type questions. The best way to prepare and get good grades for these exams is to do the following:

1. attend class regularly – usually an absence translates into not understanding a particular topic discussed in class during the absence which in turn may be related to another topic – thus it is not uncommon that a student who has been absent only once would get confused for the rest of the chapter and consequently get low grades in the exams and possibly fail the course (this is specially true in the last 3 chapters where topics are highly related to each other);

2. participate in class by giving your thoughts on a particular topic and asking questions - your participation will allow your instructor to clarify topics that are confusing to you

3. take down notes - pay attention to how the instructor writes solutions to problems, write down remarks and cautions emphasized in class, make sure your notes would describe at least the what, why and how of each topic, that is for any topic your notes should tell you
   a. What is the meaning of the topic? What is the precise definition of the topic? What is the purpose of the topic? Other “what questions” you can think of about the topic.
   b. Why is the topic important? Why is the topic relevant to the overall theme/goal of the chapter? Other “why questions” you can think about
   c. If the topic is a procedure or methodology, how is it implemented? If the topic is something you compute, how is it computed? How is the topic relevant to the overall theme/goal of the chapter? Other “how questions” you can think about.

4. read your notes and your textbook regularly before coming to class – set up some time to read and understand your notes and textbook, do this regularly before attempting to do the assigned home works and to prepare for the quizzes
5. do the assigned home works regularly – home works are assigned to supplement your understanding of the topics discussed in class, often home work problems are indicators of your understanding of a particular topic( that is, if you’re doing poorly on the home works or quizzes, it indicates that you’re not fully understanding the topic and so you should do step number 9 below)

6. review all your past quizzes regularly – oftentimes students will only review a day or two before the exam, if there is a question that they missed in a quiz usually it is too late to ask the instructor about it

7. do problems and exercises in the textbook that the instructor did not assign – the more problems you work on, the more you can assess your understanding of the materials covered in class

8. practice taking an exam regularly- set aside several one-hour periods to answer the review questions at the end of a chapter in the textbook without looking at your notes or any class material (that is, simulate taking an exam)

9. visit your instructor at his office if there is any topic that is still not clear after doing the above steps or if there is any concern about the course – some students understand a topic completely after a one-on-one interaction with the instructor, if you’re this type of student I highly recommend that you see me as much as possible during my office hours (but please don’t wait until the end of the semester and expect me to teach you everything – it’s simply not possible)

10. visit the class WebCT page regularly

**Final Exam:** The final exam is a two and a half hour exam consisting of two parts. The first part (10% of your grade) is based on the materials covered after Exam 3 which are mostly topics from Chapter 6. The second part (15% of your grade) is based on selected materials from the first 3 exams. Your score in the second part of the exam can be used to replace the lowest score on the 3 exams. **Final exam is on Monday, May 3, 2004, 12:00 nn – 2:30 pm.**

**Homeworks:** These will be given regularly and will be collected and are mostly based on problems and exercises in the textbook.

**Quizzes:** These will be given regularly either in class or through WebCT and are based on the assigned home works and the lectures.
Report: This is a written report on any concrete statistical problem. The problem may be original (your group formulates the problem and perform a statistical analysis to arrive at a reasonable solution) or previously done (for example, a journal article) and is due on the day of the third exam. This is a group report with each group consisting of no less than 3 but no more than 5 students. The report should at least include the following:

- Background of the problem - why it interest you, statement of the problem, etc.
- All data sets used in solving the problem including a description of the source – cite the journal for example
- Numerical and graphical summaries of all data sets used
- The statistical methodologies employed in arriving at the solution to the problem
- Conclusion – a discussion of the proposed solution to the problem

Your report will be graded based on the following:

- Statistical content – the more the better
- Appropriate use of technical terms
- Clarity – the problem as well as the solution should be stated clearly
- Overall presentation – the more professional looking the better

Deadlines for the report:

1. Submission of the names of group members - on the date of the 1st exam
   (those whose names are not submitted will be randomly assigned to a group)
2. Submission of report proposal - on the date of the 2nd exam
   (the proposal should include a short description of what you plan to report including the title and the source of the data)
3. Submission of the report - on the date of the 3rd exam

Final Grade: Your final grade will be determined based on your total % as follows:

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<tr>
<th>Total %</th>
<th>Final Grade</th>
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<tbody>
<tr>
<td>90% - 100%</td>
<td>A- to A</td>
<td>80% - 89%</td>
<td>B- to B+</td>
</tr>
<tr>
<td>70% - 79%</td>
<td>C- to C+</td>
<td>60% - 69%</td>
<td>D- to D+</td>
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<tr>
<td>&lt; 60%</td>
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Additional Resources/Support:

- Tutorials are regularly offered in the Mathematical Sciences Dept.’s Math Lab at Walker Hall
- Class WebCT page @ Appalnet
- Form your own study group
STT 2810 - Introduction to Statistical Inference and Data Analysis
Spring 2004 Course Outline

Course Outline

• Chapter 1 Organizing and Summarizing Univariate Data
  1.1 Essential Elements of Statistics
  1.2 Displaying Data with Tables and Graph
  1.3 Displaying Numerical Data
  1.4 Summarizing Data with Statistics
  1.5 Describing a Distribution
  1.6 Summary and Review Exercises

• Exam 1

• Chapter 2 Summarizing Relationships between Variables
  2.1 Scatterplots
  2.2 Correlation
  2.3 Least Squares Regression
  2.4 Assessing the Fit of a Line
  2.5 Relationships among Categorical Variables
  2.6 Summary and Review Exercises

• Chapter 3 Probability and Probability Distributions
  3.1 Basic Probability Concepts
  3.3 The Normal Distribution
  3.4 Summary and Review Exercises

• Exam 2

• Chapter 4 Sampling and Sampling Distributions
  4.1 Principles of Sampling
  4.2 The Sampling Distribution of $\overline{x}$
  4.3 The Sampling Distribution of the Sample Proportion $p$
  4.4 Summary and Review Exercises

• Chapter 5 Introduction to Inference and Confidence Interval Estimation
  5.1 Describing the Parent Distribution
  5.2 Estimating Population Parameters
  5.3 Confidence Interval for a Bernoulli Proportion
  5.4 Confidence Interval for a Population Mean
  5.5 Summary and Review Exercises

• Exam 3

• Chapter 6 Hypothesis Testing
  6.1 Introduction to Hypothesis Testing
  6.2 Testing a Population Proportion
  6.3 Testing a Population Mean
  6.4 Summary and Review Exercises

• Final Exam Wednesday, May 5, 2004, 9:00 am – 11:30 am