COURSE OUTLINE
INTRODUCTION TO STATISTICS I
STA 3111-01, FALL 2006

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Class Time: Monday, Wednesday & Friday: 12:30 PM to 1:45 PM at PC 213.
Office Hours: Monday & Wednesday: 2:00 PM to 3:20 PM or by appointment
Prerequisites: MAC 2147 or MGF 1106 or Junior standing.

Course Syllabus:
1. Statistics, Data, and Statistical Thinking? (Chapter 1)
Discuss the basic concepts of Statistics: data, population, sample, parameter, and statistic. Discuss the role of
statistics in the scientific method. Explain the goal of statistics. Discuss types of data, data collection and the
role of statistics in critical thinking.
2. Methods for Describing Sets of Data (Chapter 2: Sections 2.1-2.7 and 2.9, section 2.10)
Discuss graphical methods for qualitative and quantitative data, measures of central tendency, measures of vari-
ability, interpreting the standard deviation, measures of relative standing and scatterplots.
3. Probability (Chapter 3: Sections 3.1-3.7)
Discuss the basic concepts in probability: experiment, sample space, simple event, event, complement of an event,
union and intersections of events, probability of an event, conditional probabilities, independent events, mutually
exclusive events and Venn diagrams. Introduce random sampling.
4. Discrete Random Variables (Chapter 4: Sections 4.1-4.4)
Define random variable. Introduce the types of random variable. Introduce probability distributions for discrete
random variables. Compute the mean and variance of a discrete random variable. Give the characteristics of a
binomial random variable, and use the binomial tables to find the probability for possible outcomes of a binomial
experiment.
5. Continuous Random Variables (Chapter 5: Sections 5.1 and 5.3)
Introduce probability distributions for continuous random variables with emphasis on the normal distribution.
Use the standard normal table to find probabilities.
6. Sampling Distributions (Chapter 6: Sections 6.1-6.3)
Define sampling distribution of a sample statistic, and list the desired properties of a good estimator. Introduce
the sampling distribution of the sample mean from a normal distribution. State the Central Limit Theorem in
terms of the sampling distribution of \( \bar{x} \). Use the standard normal table to find probabilities associated with \( \bar{x} \).
7. Inferences Based on A Single Sample: Estimation (Chapter 7:Sections 7.1-7.4)
Define confidence interval. Compute confidence intervals for \( \mu \) based on both large and small samples and
confidence intervals for the binomial parameter, \( p \), for large samples.
8. Inferences Based on A Single Sample: Tests of Hypotheses (Chapter 8: Sections 8.1-8.5)
Discuss the elements of a test of hypothesis. Define Type I and Type II errors. Perform tests of hypotheses about
\( \mu \) and \( p \) based on large samples and about \( \mu \) based on small samples. Define the observed significance level of the
test statistic, \( p \)-value.
9. Inferences Based on Two Samples: Estimation and Tests of Hypotheses (Chapter 9: Sections
9.1-9.5) Test hypotheses about \( \mu_1 - \mu_2 \) and \( p_1 - p_2 \) based on independent large samples, about \( \mu_1 - \mu_2 \) based on
independent small samples and about $\mu_D = \mu_1 - \mu_2$ based on dependent small samples. Perform tests of equality for two population variances.

10. Analysis of Variance: Comparing More Than Two Means (Chapter 10: Sections 10.1 - 10.3)
Discuss designed experiments. Test hypotheses about two or more means using a completely randomized design. Interpret pairwise comparisons of means from computer output.

Note: A scientific calculator is required for this course.

Course Evaluation: There will be four exams and tentatively the weighting scheme is as follows:

<table>
<thead>
<tr>
<th>Exam Type</th>
<th>Percentage</th>
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</thead>
<tbody>
<tr>
<td>Midterm Exam I</td>
<td>20%</td>
</tr>
<tr>
<td>Midterm Exam II</td>
<td>20%</td>
</tr>
<tr>
<td>Midterm Exam III</td>
<td>20%</td>
</tr>
<tr>
<td>Final Exam</td>
<td>40%</td>
</tr>
</tbody>
</table>

Grading Scale: The weighted average of the scores in the three exams will be converted to a percentage. The following scale will then be used to assign letter grades for the course.

<table>
<thead>
<tr>
<th>Grade</th>
<th>Percentage Range</th>
</tr>
</thead>
<tbody>
<tr>
<td>A</td>
<td>(90% and +)</td>
</tr>
<tr>
<td>A-</td>
<td>(87% to 89%)</td>
</tr>
<tr>
<td>B+</td>
<td>(84% to 86%)</td>
</tr>
<tr>
<td>B</td>
<td>(80% to 83%)</td>
</tr>
<tr>
<td>B-</td>
<td>(77% to 79%)</td>
</tr>
<tr>
<td>C+</td>
<td>(74% to 76%)</td>
</tr>
<tr>
<td>C</td>
<td>(70% to 73%)</td>
</tr>
<tr>
<td>C-</td>
<td>(67% to 69%)</td>
</tr>
<tr>
<td>D+</td>
<td>(64% to 66%)</td>
</tr>
<tr>
<td>D</td>
<td>(60% to 63%)</td>
</tr>
<tr>
<td>D-</td>
<td>(57% to 59%)</td>
</tr>
<tr>
<td>F</td>
<td>(0% to 56%)</td>
</tr>
</tbody>
</table>

The first midterm exam will be held on September 20 (Wednesday), 2006 and exam covers the materials until September 18 (Monday), 2006.

The second midterm exam will be held on October 16 (Monday), 2006 and exam covers the materials until October 13 (Friday), 2006.

The third midterm exam will be held on November 13 (Monday), 2006 and exam covers the materials until November 8 (Wednesday), 2006.

The final exam is cumulative and will be held on December 11 (Monday), 2006, between 12:30 PM to 3:15 PM.

Home works: During the semester some problems will be assigned from text. Doing homework is strongly recommended. The answers of the odd problems can be found at the back of the text book.

Some Important Dates:
1. September 5 (Tuesday), 2006: Last day to complete late registration, change grading option, drop/withdraw courses without incurring a financial liability
2. September 22 (Friday), 2006: Last day to withdraw from the University with a 25% refund of tuition.
3. November 3 (Friday) 2006: Deadline to droop a course with DR grade and to withdraw from the University with a WI grade.

Note: The instructor is not responsible about the exact date or time or adding/dropping the course etc.

4. Classes end on December 7 (Thursday) 2006.

Makeup’s: No make-up exam will be given, however, if an extenuating circumstance exists, please contact the instructor prior to the exam. All students are required to attend/write /complete the final exam. Failure to write it will result in a grade of “F” for the course. No extra work will be given to improve the grade.

Incomplete: The incomplete (I) grade will be given ONLY to a student who has completed the bulk of the course works and is unable to complete the course due to a serious interruption not caused by the student’s own negligence.

Attendance: Students are expected to attend the classes regularly. If a student misses (or fails to attend) a class, it is his/her sole responsibility to obtain the missing information (for examples change of exam date, change of exam location, add/ omit some sections, class notes, new home works etc). Students are encouraged to seek the instructors help during office hours.

Notice: The course outline provides a general plan/guide for the course only, however, deviation or some changes may be necessary. The instructor will assume the sole authority in all matters related to course content, students gradings, and classroom procedures. No active beeper or cellular phones are allowed in classes. You should not register in this class if your final exam conflicts with other course.