MATH 115 ELEMENTARY STATISTICS
RESEARCH PAPER

The purpose of this paper is to have the student find actual applications, mis-applications, or personal analyses of statistics found outside the classroom. It can take on multiple formats from a critical analysis of a recent newspaper article; review of an actual "journal" article; or your own statistical analysis of an employment or personal interest application. Please use the attached "Research Paper Proposal" form/format for your submission.

Examples of possible topics can include:

- Review of an newspaper/magazine article about:
  - Political polls
  - Changes in unemployment or other economic data
  - Any other statistic of your choice
- Critically discuss an article in a scientific journal that uses statistics
- Take data from work and statistically analyze it
  - Sales by day or month (number or volume)
  - Number of times something happens or time between occurrences
- Take an area of interest and analyze it
  - Batting averages or QB ratings over time or between/among teams
  - Horse racing results; sports records; census data
  - What bets are best for the "house" or bettor in Atlantic City
  - Lottery odds and payouts. Does it EVER pay to buy a ticket?
- Your own teacher-approved topic
  - Develop and evaluate your own experiment
  - Critically discuss an applied statistics book

Statistical tests can include:

- Simple or binomial probability theory; expected value
- Z- or t-tests*
- Correlation analysis*
- Regression analysis*

* These topics will not be covered prior to thesis submission. Support will be given inside/outside of class to allow you to begin your analysis/research using these techniques.

Format:

- Thesis statement -- a statement of what you intend to support or demonstrate.
- Discussion of procedures **–** the procedures you used in the attempt to support your thesis. For a critical analysis, the actual critical analysis of your subject.
- Test data or analysis- your actual results.
- Inferential analysis- What do your data tell you? What are your conclusions/positions?

Grading:

Submission of objective or hypothesis of paper	10 percent
Development of correct statistical approach/analysis	30 percent
Valid conclusions/analysis from approach	25 percent
Academic credibility of report	35 percent

NOTE: Any paper that proposes to develop a hypothesis (e.g. Higher QB ratings win more games) MUST use a statistical analysis to support or not support the hypothesis. Failure to do so will result in a loss of 30 points from the paper's final grade

Dates: Research Proposal due: **Monday, October 2, 2011 (email is acceptable)**
Paper due: **Monday, December 12, 2011 (email is acceptable)**

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Research Paper Proposal

Note: The proposal does not include the "Conclusions" section of this form. It is there only to give you an outline as to how to write your final paper.

Name:

Topic or Hypothesis:
(Title of book or article to be critically analyzed; questionnaire, sampling, and analysis topic; hypothesis to be tested)

Data Collection:
(How will you collect your data to support or to perform the analysis mentioned above? How many data points will you collect and where will you get the data?)
Note: Not necessary for critical analysis topic

Data Analysis:
(What statistical test(s) will you use to test your hypothesis? At what level of confidence to you propose to evaluate the hypothesis (α)?)
For an article or book analysis, what is your aim/intention in discussing your choice?

Conclusions/your perspective:
(What were your results? What did your analysis show? Did it support your hypothesis? What inferential analyses can you draw? What problems in your data collection might have led to a wrong/unfavorable conclusion?)
For an article or book analysis, what major statistical or other factors were evident from your reading? Did you agree or disagree with the author? What were the major points you took away from the reading?