Instructor: Thomas W. Reiland, 5278 SAS Hall, reiland@stat.ncsu.edu, ph: 515-1939;  
Graduate Assistant: tba, 1101 SAS Hall

Office Hours: Reiland: 11:20 - 12:00 MTWThF 1108 SAS (immediately following lecture),  
and by arrangement; Graduate Assistant 1108 SAS Hall

Time and Place of Lecture: MTWThF 9:50-11:20 SAS Hall 1108

GEP Requirements Satisfied: None

Course Description: Prerequisite: ST 371. ST 372-001 is a calculus-based course in statistics  
covering estimation theory, hypothesis testing, inference for categorical data, simple and  
multiple regression, and other topics as time permits. ST 372-001 is NOT a math course. The  
central theme of the course is to help you learn to understand the world from data. "Beyond  
the formula" skills are emphasized. This course will require you to: think critically, be  
skeptical, think about variation (rather than just about the center), move beyond a "memorize  
the answer" approach, and think about conditional probabilities and rare events to make  
inferences from data. Some mathematical skill will be required to work in the area of  
statistical estimation, but in general mathematical manipulations will be replaced by relying  
on technology for the calculations and graphics; this will allow more emphasis to be placed on  
the "beyond the formula" skills mentioned above. Examples to convey the broad applicability  
of statistical methods will be provided, but the principal emphasis throughout the course will  
be the logic of statistical inference from experimental data.

Text: Probability and Statistics for Engineering and the Sciences, 8th ed., Jay L. Devore,  

Exams: Midterm Exam: Tuesday July 15  
Final Exam: Friday August 1, 8:00-11:00 AM

The final exam is non-cumulative; no exemptions from the final exam will be granted. For  
each exam students are allowed one 5 x 7 card containing formulae, definitions and any  
information he or she thinks is needed for the exam. Calculators are required. Practice  
problems with solutions will be available before each exam.

Homework: There will be eight homework assignments during the course. In general there  
will be two homework assignments per week due at the beginning of lecture on Tuesday and  
Friday. Each assignment will consist of 2 to 4 problems that will be graded and returned.  
Solutions to the homework problems will be posted on our class webpage. Each assignment  
will be given a grade from 0 to 25. Students are allowed (even encouraged) to discuss  
homework problems with each other. However, the write-ups of the answers must be done  
independently. Violations of this rule will not be tolerated and will be considered cheating.
**Grading:** The following components will contribute the indicated points to your final grade:

- Midterm Exam 125 points
- Final Exam 175 points
- Homework 200 points
- Worksheets 100 points

Total 600 points

Your grade in the course is assigned according to the percentages shown in the table below. The percentage score, rounded to 2 decimal places, is determined by summing your exam scores (300 points possible), homework score (200 total points possible), lecture worksheet score (100 points possible) and dividing this sum by 600.

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**GRADING: LATE WORK AND "DO-OVERS"

Late work will be accepted at the discretion of the instructor and must be arranged at the student's initiative within two days of the due date, prior to two days before the end of classes. This policy includes homework and lecture worksheets. For example: i) in week 3 of the semester don't ask to submit the week 1 assignment that you "forgot" to submit in week 1; ii) don't submit, for example, 10 lecture worksheets the last week of the semester.

**GRADING: SPECIAL CONSIDERATIONS**

THERE AREN'T ANY!! Do not ask for individually-tailored opportunities for extra credit (such as additional homework or projects) to enhance your grade, particularly at the end of the semester. All students will be assigned a grade based on the work that is assigned to the entire class. If you need to attain a specific grade in this course for whatever reason, make plans at the beginning of the semester to do the work necessary to attain the grade, and stay with the plan.

Students may be given an IN (incomplete) grade for work not completed because of a serious interruption in their work not caused by their own negligence. See IN Grade Policy [http://policies.ncsu.edu/regulation/reg-02-50-03](http://policies.ncsu.edu/regulation/reg-02-50-03) for the University IN grade policy. In the case of a student medical condition, no incomplete grade for this course will be considered without a verifiable, written doctor's note indicating incapacitation for more than three lectures.

**Class Attendance:** Consistent class attendance is strongly recommended; past experience indicates that excessive absences will hurt your grade.
ST 372 Course Information

Syllabus

ST 372-001 Introduction to Statistical Inference and Regression

Summer 2014


I. Sampling Distribution Models and the Central Limit Theorem
   1. SAMPLING DISTRIBUTION MODEL OF THE SAMPLE PROPORTION
      1.1 Numerical Summaries of Center and Spread; Shape
   2. SAMPLING DISTRIBUTION MODEL OF THE SAMPLE MEAN AND THE CENTRAL LIMIT THEOREM
      2.1 Numerical Summaries of Center and Spread; Shape
      2.2 Central Limit Theorem

II. Point Estimation
   3. GENERAL CONCEPTS OF POINT ESTIMATION
      3.1 Method of Moments
      3.2 Method of Maximum Likelihood

III. INFERENCE BASED ON A SINGLE SAMPLE
   4. INFERENCE FOR A POPULATION PROPORTION
      4.1 Confidence Intervals for a Population Proportion, Required Sample Size
      4.2 Hypothesis Testing for a Population Proportion, P-values, Type I and Type II Errors, Required Sample Size
   5. INFERENCE FOR A POPULATION MEAN
      5.1 Confidence Intervals for a Population Mean, t-Distributions
      5.2 Hypothesis Testing for a Population Mean

IV. INFERENCE BASED ON TWO SAMPLES
   6. COMPARING PROPORTIONS
      6.1 Confidence Intervals for Two Proportions
      6.2 Hypothesis Tests for Two Proportions
   7. COMPARING MEANS
      7.1 Confidence Intervals for Two Means, Independent Samples and Paired Samples
      7.2 Hypothesis Tests for Two Means, Independent Samples and Paired Samples

V. GOODNESS OF FIT TESTS AND CATEGORICAL DATA ANALYSIS
   8. GOODNESS OF FIT TESTS
   9. TESTS OF HOMOGENEITY AND INDEPENDENCE
VI. INFERENCE WHEN VARIABLES ARE RELATED
   10. BIVARIATE DATA
      10.1 Scatterplots, Correlation
      10.2 Least Squares Lines
      10.3 Inference for Simple Linear Regression
   11. MULTIVARIATE DATA
      11.1 Multiple Regression
   12. ANALYSIS OF VARIANCE