

**Summer '15 C - STAT 515: Statistical Methods I –Section 001**  
**M-F 10:05A-11:20A in Davis(room 209)**

**Instructor:** William Cipolli  
**Office:** LeConte 127  
**Office Hours:** By appointment  
**E-mail:** [william.cipolli@gmail.com](mailto:william.cipolli@gmail.com)  
**Website:** [www.stat.sc.edu/~cipolli](http://www.stat.sc.edu/~cipolli)

**Bulletin Description:** Statistical Methods I. (3) (Prereq: a grade of C or higher in MATH 111 or equivalent) Applications and principles of descriptive statistics, elementary probability, sampling distributions, estimation, and hypothesis testing. Inferences for means, variances, proportions, simple linear regression, and contingency tables. Statistical packages such as SAS.

**Purpose of the Course:** To familiarize students in a variety of fields with modern statistical methods, including the general areas of data description, elementary probability, and statistical inference. To prepare the students to further their study in statistical topics such as quality control, design of experiments, nonparametrics, time series, and sampling.

**Learning Outcomes:** By the end of the term successful students should be able to do the following:

- Demonstrate the ability to correctly use basic statistical terms.
- Demonstrate the ability to correctly implement and interpret descriptive statistical methods.
- Demonstrate the ability to correctly implement the basic principles of probability.
- Demonstrate an understanding of sampling distributions, confidence intervals, and hypothesis testing.
- Select, implement, and interpret the appropriate statistical methods for one and two samples for means, variances, and proportions.
- Select, implement, and interpret the appropriate methods related to one-way ANOVA, simple linear regression, and the chi-square tests for goodness of fit, homogeneity, and independence.

**Expectations:** All students are expected to:

- Attend class regularly, asking questions when clarification is needed and participating in any in-class activities
- Read the pages covered in each class before the following class period. These pages will be listed on blackboard following each class.
- Attempt all of the assigned homework problems and turn them in before the start of the class they are due.
- Use the resource of their fellow students and their instructor (including through Blackboard) to seek answers to questions that arise in class, in the readings, and on the homework

**Textbook:** *Statistics* (12th Edition), by J.T. McClave and T. Sincich, Prentice Hall, 2012.  
Supplements to the textbook will be posted on blackboard.

**Computers:** The statistical packages SAS and R will be used throughout the semester and you will need access to one of them. No previous experience with either of the packages is needed. Templates will be provided on Blackboard for conducting the data analysis. SAS is available in several labs on campus, and licenses are available from University Technology Services. R is available at [r-project.org](http://r-project.org) for free.

**Honor Code:** See the *Carolinian Creed* in the *Carolina Community: Student Handbook & Policy Guide*. Violations of the USC Honor Code may result in a 0 for the work in question, and, in accordance with University policy, other punishments up to and including expulsion from the University.

**Accommodations:** If you require special accommodations, they must be arranged in advance through the Office of Student Disability Services in room 112A LeConte (777-6142, TDD 777-6744, [sasds@mailbox.sc.edu](mailto:sasds@mailbox.sc.edu)).

**Schedule:**

Lecture	Date	Chapter	List of Topics
1	11-May	1	Introduction
2	12-May	2.1-2.4	Graphical Displays and Measures of Center
3	13-May	2.5-2.6	Shapes (if not covered yet) and Measures of Spread
4	14-May	2.7-2.8	Introduction to SAS and R, Boxplots
5	15-May	3.1-3.6	Basic Rules of Probability
6	18-May	3.7-3.8, 3.9	Probability Continued
7	19-May	4.1-4.4, 4.6	The Binomial and Discrete Random Variables
8	20-May	5.1-5.3	The Normal and Continuous Random Variables
9	21-May	5.4, 5.5	QQ-Plots and the Normal Approximation to the Binomial
10	22-May	6.1-6.3	Sampling Distributions and the CLT
<b>EXAM 1</b>	<b>25-May</b>		<b>Exam 1: Covers Lectures 1-8</b>
11	26-May	Supp 6	More on Sampling Distributions (t, chi-square, and F)
12	27-May	7.1-7.3, 7.6, Supp 7.6	Introduction to Confidence Intervals
13	28-May	7.4, 7.5	Finish Confidence Intervals
14	29-May	8.1-8.4	Begin Hypothesis Tests
15	1-Jun	8.4-8.6 and 8.8	Hypothesis Tests Continued
16	2-Jun	9.1-9.4	Two-sample procedures
17	3-Jun	8.7, Supp to 8.7	Two-sample Examples and Power
18	4-Jun	10.1-10.2	Introduction to Linear Models and Idea of ANOVA
19	5-Jun	10.2, Supp 10.2	The ANOVA table in detail
<b>EXAM 2</b>	<b>8-Jun</b>		<b>Exam 2: Covers Lectures 9-17</b>
20	9-Jun	11.1-11.2	Regression: Least Squares, the Model, and the MSE
21	10-Jun	11.3, Supp 11.3-11.4	Regression: The ANOVA table, and Assumptions
22	11-Jun	11.4, 11.6	Regression: The T-Test and the Intervals
23	12-Jun	11.5	Regression: The Correlation Coefficient
24	15-Jun	13.1-13.2	Chi-squared Goodness of Fit Test
25	16-Jun	13.3, Supp 13.3	Chi-squared test for Homogeneity and Independence
26	17-Jun	Review	Review for Exam 3 and the final exam
<b>EXAM 3</b>	<b>18-Jun</b>		<b>Exam 3: Covers Lectures 18-25</b>
<b>No Class</b>	<b>19-Jun</b>		<b>Reading Day</b>
<b>FINAL</b>	<b>20-Jun</b>		<b>Final Exam: Covers Lectures 1-25</b>

**Exams and Topics Covered** (4 exams, 75 points each): Make-up exams are given under extraordinary circumstances and at my discretion.

- The first hour exam will be given on **5/25/15**. It will be related to the descriptive statistics and probability material covered in Chapters 1 through 5.3.
- The second hour exam will be given on **6/8/15**. It will focus on sampling distributions, confidence intervals, and hypothesis tests, as found in Section 5.4 up to Chapter 9.
- The third hour exam will be given on **6/17/15**. It will focus on one-way ANOVA and simple linear regression as found in Chapters 10 and 11 as well as the Chi-squared topics from Chapter 13.
- The final exam will be given on **6/20/15**. It will be cumulative, covering both the material from the previous three exams.

All exams are closed note, closed book. You will be provided with a formula sheet and may use a calculator that is NON-programmable and NON-graphing.

If the score on the final exam is higher than the lowest exam score, it will be counted in the place of that exam score for the determination of the course grade.

**Homework** (60 points): Homework will be assigned most days to be due at the **beginning** of class the following day. Late homework is not accepted except in extraordinary circumstances and at my discretion. Homework will be assigned at least one week in advance in class, and will also be posted on the class website.

Any writing on the homework must be legible, the work used to obtain the answers must be shown and correct, and the final answers must be clearly indicated in order to receive full credit. Extra points may be deducted for violating any of the following:

- Include your name on the front page of the assignment
- Write/print on one side of the paper only.
- Multiple pages must be stapled together. No paper clips.
- Copies of the SAS or R code must be included with any homework requiring SAS or R.
- Extraneous pages of SAS or R output should not be turned in.

You **MAY** work on the homework assignments with other students, but each student must write it up individually. (i.e., No photocopies of another student's work.)

**Minimum percent for each grade** (calculated from the 300 points on the exams, 60 points on the homework):

A 90%      B+ 87%      B 80%      C+ 77%      C 70%      D+ 67%      D 60%

Any questions involving the grading of a homework or exam must be raised by the class period following the one in which it was returned. There is no "extra credit". I reserve the right to modify the above grading scheme on the condition that any modifications are applied uniformly to all students and that no resulting grade is lower than the one that would be earned from the above scheme.

**Graduate Credit:** Students taking the course for graduate credit will have additional and/or modified questions on the homework assignments and exams that cover the material at greater depth. Further, the requirements for partial credit will be more stringent for graduate students than undergraduates.