STA 2122 – INTRODUCTION TO APPLIED STATISTICS
SECTION 01 FALL 2017
MON & WED 11:15AM-12:05PM, 101 HCB
MODE OF INSTRUCTION: TRADITIONAL

Instructor: Ms. Radha Bose
Email: bose@stat.fsu.edu
Office: 210C OSB
Phone: 644-3218 (Statistics Main Office)
Office Hours: Wed 10:00—11:00am & Thu 3:30-4:30pm
Course Location/Website:
https://cas.fsu.edu/cas/login?service=https%3A%2F%2Fmy.fsu.edu%2Fc%2Fportal%2Flogin

Syllabus Change Policy
Except for changes that substantially affect implementation of the evaluation (grading) statement, this
syllabus is a guide for the course and is subject to change with advance notice.

COURSE DESCRIPTION:
Prerequisite: A grade of “C-“ or better in MAC 1105 College Algebra (or equivalent).
Credit Hours: 3
Special Note: No credit given for STA 2122 if a grade of “C-“ or better is earned in STA 2171, STA
3032 or QMB 3200.

The course covers Normal distributions, sampling variation, confidence intervals, hypothesis
testing, one-way and two-way analysis of variance, correlation, simple and multiple regression,
contingency tables and chi-square tests, non-parametric statistics.

The purpose of this course is to prepare students for further study and job preparation in the
field of Natural Sciences. It will emphasize understanding of data and interpretation of statistical
analyses. It will require students to think of data, and report the results of their analyses, in context.

COURSE OBJECTIVES:
This course has been approved to meet FSU’s Liberal Studies Quantitative and Logical Thinking
requirements and is designed to help you become a critical analyst of quantitative and logical claims.
In order to fulfill the State of Florida’s College mathematics and computation requirement the student
must earn a “C-“ or better in the course.

By the end of the course, students will demonstrate the ability to:
(1) Select and apply appropriate methods (i.e., mathematical, statistical, logical, and/or computational
models or principles) to solve real-world problems.
(2) Use a variety of forms to represent problems and their solutions.
The above two competencies will be assessed in the Liberal Studies Quantitative Assessment for STA
2122, which includes a written summary of results.
(3) Use descriptive statistics and graphical methods to summarize data accurately.
(4) Use inferential statistics to make valid judgments based on the data available.
(5) Select the appropriate statistical tools to analyze a particular problem.
(6) Describe the goals of various statistical methodologies conceptually.
(7) Develop a healthy skepticism toward statistical studies and their results based on a sensible consideration of the techniques employed.

COURSE MATERIALS:

Instructional Technologies:
~ Calculator: TI-84 Plus or equivalent type
~ Textbook: The Basic Practice of Statistics, 7th ed. by Moore Notz Fligner

Concerning Required Readings: You will need to read certain sections of the textbook - sections will be specified on the course website. You will also need to read some course notes that will be posted on the University learning management system. Hardcopies of the course notes will not be provided.

COURSE ASSIGNMENTS AND EVALUATION:

Quizzes (50%): 6 quizzes given in recitation. You may use a calculator, an 8½”x11” notesheet, statistical tables and scratch paper. You may not share calculators and you may not use a cell phone as a calculator. The quizzes are not cumulative in nature.

Activities (20%): 6 group activities given in recitation. For each activity, you will get 100% for being present and participating, 50% for being present but not participating and 0% for being absent. Also, if you arrive more than 15 mins late or leave more than 15 mins early you will only get 50%.

Final Exam (30%): the final exam is cumulative.

GRADE CALCULATION:
Quiz Average 50%
Activity Average 20%
Final Exam 30%

GRADING SCALE:
A 93% or above
A- [90%, 93%)
B+ [87%, 90%)
B [83%, 87%)
B- [80%, 83%)
C+ [77%, 80%)
C [73%, 77%)
C- [70%, 73%)
D+ [67%, 70%)
D [63%, 67%)
D- [60%, 63%)
F [0%, 60%)

COURSE SCHEDULE:

<table>
<thead>
<tr>
<th>WEEK</th>
<th>TOPICS TO BE COVERED</th>
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<tbody>
<tr>
<td>1</td>
<td>Graphs, Summary Statistics</td>
</tr>
<tr>
<td>2</td>
<td>Normal Distributions</td>
</tr>
<tr>
<td>3</td>
<td>Central Limit Theorem</td>
</tr>
<tr>
<td>4</td>
<td>One-sample Confidence Intervals</td>
</tr>
<tr>
<td>5</td>
<td>One-sample Hypothesis Tests</td>
</tr>
<tr>
<td>6</td>
<td>One-sample Hypothesis Tests</td>
</tr>
<tr>
<td>7</td>
<td>One-way Anova</td>
</tr>
<tr>
<td>8</td>
<td>Two-way Anova</td>
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<tr>
<td>9</td>
<td>Correlation, Simple Linear Regression</td>
</tr>
<tr>
<td>10</td>
<td>Simple Linear Regression</td>
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<tr>
<td>11</td>
<td>Multiple Regression</td>
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<tr>
<td>12</td>
<td>Contingency Tables</td>
</tr>
<tr>
<td>13</td>
<td>Chi-Square Tests</td>
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<tr>
<td>14</td>
<td>Nonparametric Statistics</td>
</tr>
<tr>
<td>15</td>
<td>Nonparametric Statistics</td>
</tr>
<tr>
<td>16</td>
<td>Final Exam Mon Dec 7th 7:30-9:30AM</td>
</tr>
</tbody>
</table>

**University Attendance Policy:**
Excused absences include documented illness, deaths in the family and other documented crises, call to active military duty or jury duty, religious holy days, and official University activities. These absences will be accommodated in a way that does not arbitrarily penalize students who have a valid excuse. Consideration will also be given to students whose dependent children experience serious illness.

**Academic Honor Policy:**
The Florida State University Academic Honor Policy outlines the University's expectations for the integrity of students' academic work, the procedures for resolving alleged violations of those expectations, and the rights and responsibilities of students and faculty members throughout the process. Students are responsible for reading the Academic Honor Policy and for living up to their pledge to "...be honest and truthful and...[to] strive for personal and institutional integrity at Florida State University."  (Florida State University Academic Honor Policy, found at [http://fda.fsu.edu/academic-resources/academic-integrity-and-grievances/academic-honor-policy](http://fda.fsu.edu/academic-resources/academic-integrity-and-grievances/academic-honor-policy).)

**Americans With Disabilities Act:**
Students with disabilities needing academic accommodation should:
(1) register with and provide documentation to the Student Disability Resource Center; and
(2) bring a letter to the instructor indicating the need for accommodation and what type.
Please note that instructors are not allowed to provide classroom accommodation to a student until appropriate verification from the Student Disability Resource Center has been provided.
This syllabus and other class materials are available in alternative format upon request.
For more information about services available to FSU students with disabilities, contact the:
Student Disability Resource Center
874 Traditions Way
108 Student Services Building
Florida State University
Tallahassee, FL 32306-4167
(850) 644-9566 (voice)
(850) 644-8504 (TDD)
sdrc@admin.fsu.edu
[http://www.disabilitycenter.fsu.edu/](http://www.disabilitycenter.fsu.edu/)

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This assessment is designed to assess the Liberal Arts Quantitative and Logical Claims Competencies and Goals. Students who successfully complete the assessment will have demonstrated the ability to (1) analyze and address problems drawn from real world scenarios by applying appropriate mathematical, statistical, logical, and/or computational models or principles, and (2) interpret and evaluate data and information as presented in a variety of modes (such as tables, graphs, and charts), using appropriate technology. They will also be able to clearly communicate a summary of their findings to peers.

Note: This assessment will be graded out of 20 points, but each instructor will scale this number to fit her/his course grade structure.

You may use your calculator.

The data for this exercise was obtained from Wikipedia at http://en.wikipedia.org/wiki/List_of_counties_in_Florida and the population figures come originally from the 2010 United States Census.

Real world question:
Florida urban planners are trying to decide if they should put more money towards infrastructure. They have decided that if there is evidence to suggest that the average density of all the counties in Florida is above 220 people per square mile then they will increase the infrastructure budget.

<table>
<thead>
<tr>
<th>County</th>
<th>Density</th>
</tr>
</thead>
<tbody>
<tr>
<td>Taylor</td>
<td>21.8</td>
</tr>
<tr>
<td>Bradford</td>
<td>96.4</td>
</tr>
<tr>
<td>Flagler</td>
<td>200.8</td>
</tr>
<tr>
<td>Dixie</td>
<td>23.4</td>
</tr>
<tr>
<td>Manatee</td>
<td>441.5</td>
</tr>
<tr>
<td>Hamilton</td>
<td>28.5</td>
</tr>
<tr>
<td>Hardee</td>
<td>43.8</td>
</tr>
<tr>
<td>Okaloosa</td>
<td>196.0</td>
</tr>
<tr>
<td>Columbia</td>
<td>84.7</td>
</tr>
<tr>
<td>Santa Rosa</td>
<td>151.7</td>
</tr>
<tr>
<td>Walton</td>
<td>52.7</td>
</tr>
<tr>
<td>Lake</td>
<td>315.9</td>
</tr>
</tbody>
</table>

[4 pts] (1) The data in the table above are the densities, in people per square mile, of a random sample of Florida counties. Use that data to find the best point estimate of the average density of all Florida counties. State units with your answer.
[4 pts] (2) Report an appropriate 95% one-sample confidence interval for the mean density of all the Florida counties. You may assume for the moment that the population of all Florida county densities is approximately Normally distributed with standard deviation 125 people per square mile.

[4 pts] (3) Interpret your confidence interval in words, in context.
[4 pts] (4) Based on your confidence interval, what would you tell the urban planners? Is there evidence to suggest that the average density of all Florida counties is greater than 220 people per square mile? Should they invest more money in infrastructure?

[2 pts] (5) Which ONE of the following strategies will result in a confidence interval that has a smaller margin of error than the one you had in #(2)? **Circle the correct answer.**

(A) Using a higher confidence level than 95%, all else remaining the same.

(B) Using a higher confidence level than 95% and including less than 12 counties in the sample.

(C) Including more than 12 counties in the sample, all else remaining the same.

(D) Including less than 12 counties in the sample, all else remaining the same.

[2 pts] (6) In #(2), we assumed that the population of all Florida county densities was approximately Normally distributed. If the population were skewed, which ONE of the following measures would make the procedure in #(2) still valid? **Circle the correct answer.**

(A) Use a higher confidence level than 95%.

(B) Use a lower confidence level than 95%.

(C) Include only 5 counties in the sample, not 12.

(D) Include 50 counties in the sample instead of just 12.

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For Instructor’s Use. Please do not write in this space.

<table>
<thead>
<tr>
<th>Competency-Skill</th>
<th>Individual Question Scores</th>
<th>C1</th>
<th>C2</th>
</tr>
</thead>
<tbody>
<tr>
<td>C1-AA</td>
<td>#2 =</td>
<td></td>
<td></td>
</tr>
<tr>
<td>C12-ACT</td>
<td>#5 + #6 =</td>
<td></td>
<td></td>
</tr>
<tr>
<td>C12-T</td>
<td>#1 =</td>
<td></td>
<td></td>
</tr>
<tr>
<td>C2-C</td>
<td>#4 =</td>
<td></td>
<td></td>
</tr>
<tr>
<td>C2-I</td>
<td>#3 =</td>
<td></td>
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