MATH 54—Elementary Statistics
Course Syllabus—Spring 2015

T TH 12:45 – 2:50 PM    MC66  Section 2687
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Office Number:  (310) 434 – 3972
Office Hours:  Monday and Wednesday 9:30 – 10:30 a.m. and Tuesday 7 a.m. – 8 a.m.
Math Lab Hour:  Wednesday 11 a.m. – 12 p.m.  MC84B (Statistics Workshop)

Course Homepage:  http://homepage.smc.edu/edinger_gail/

Prerequisite:  Completion of Intermediate Algebra (Math 20), or equivalent, with a grade of C or better.

Textbook:  Statistics: Informed Decision Using Data, 4th edition, by Michael Sullivan III.  To access the online portion of our class you will need a MyMathLab/MyStatLab student access code. Open your MyMathLab/MyStatLab Student Access Kit and follow the direction (http://pearsonmylabandmastering.com/). Follow the registration instructions on the handout. Registration within MyMathLab is required by February 26, 2014. If you are not registered for MyMathLab by this date, you WILL BE DROPPED FROM THE CLASS. Under no circumstances will this deadline be extended. Note that you can register for a 14 day trial for free, so there is no excuse for not registering by the deadline. After 14 days you will need to register with an access code, either purchased or included with the new textbook or with a credit card.

Calculator:  TI 83 (or TI-83 Plus or the new TI 84 Plus) Calculator is required
This is the only calculator that we will be teaching in class and you are expected to bring this to all classes. All exams will be written assuming that you have this calculator. This calculator has special statistical functions that we will be using in class and it will be extremely difficult to complete the exams if you are not using this calculator. If you choose to use a different one, you are ENTIRELY on your own to figure out how to use that calculator and you are warned that it will probably be difficult to complete the exam on time and find the answers to some of the exam problems. If you choose not to use the calculator, no extra time or special consideration will be given on the exams, you will assume all consequences of any disadvantages from this choice. You may NOT use a cell phone or any other device that contains a calculator for quizzes and exams. Your calculator must be just that, a calculator. Calculators may not be shared.

Course Description:  This course covers concepts and procedures of descriptive statistics, elementary probability theory and inferential statistics. Course material includes: summarizing data in tables and graphs; computation of descriptive statistics; measures of central tendency; variation; percentiles; sample spaces; classical probability theory; rules of probability; probability distributions; binomial, normal, T, Chi-square and F distributions; making inferences; decisions and predictions. This course develops confidence intervals for population parameters, hypothesis testing for both one and two populations, correlation and regression, ANOVA, test for independence and non-parametric method. This course develops statistical thinking through the study of applications in a variety of disciplines. The use of a statistical/graphing calculator or statistical analysis software is integrated into the course.

Calculator/Exam policy:  You will be able to use the TI-83/84 on all exams. You may not share or borrow any calculator during an exam or quiz. If you forget your calculator, you will be doing the exam without one. It is entirely your responsibility to have your calculator. Due to academic honestly issues, you MAY NOT SHARE OR BORROW calculators during exams and quizzes. I do not lend mine for use on exams or quizzes.

Attendance:  Attendance is expected and encouraged. I will take attendance at every class. If you are absent for all or part of more than 4 classes, you may be withdrawn for nonattendance, regardless of current grade in the class.

If you intend to drop the class, do not just stop coming. It is your responsibility to do the paperwork. If you fail to do the paperwork, you will receive a grade in the class.
If you are absent, you are still responsible for all material covered. You will be expected to complete and turn in all assignments on time. You may call me, email me or contact a classmate to find out what you have missed so that you can complete the material. You are also responsible for any changes to the syllabus, including changes in exam dates and assignment dates.

**Homework:** You are expected to do homework after every class. It is an important part of this class and crucial to your success. The homework exercises are online; available from any computer, any time, as long as the MathXL plugin is installed. Try to spread it out over the week, rather than do it all the night before. The homework is interactive, meaning you can get help, view an example, and see the solution worked out in detail, step by step. There are also instructional videos available of an instructor giving lectures and working out problems from all topics we cover in the class. It’s like having “a professor in your computer.” The work you need to do to complete your online homework should be neatly written in your notebook together with the title, section and the grade you earn. **Absolutely no late homework will be accepted.** Your notebook is due on the day of the exam. It is the student's responsibility to be sure that there is enough time to complete the online homework. No excuses for late work will be accepted and no extensions will be granted for any reason, this includes but is not limited to personal situations, internet and/or computer issues, work issues, etc. Please do not contact me asking for an extension. My best advice is to start EARLY.

**Collected Homework:** Additional assignments will be given during the semester that will be graded and will count toward your final average. In class assignments will be due in class and can only be completed on that day. This means that if you are absent for any in class work, you will receive a grade of 0 for the assignment. Collected work completed out of class is due on the assigned due at the beginning of class. No late work will be accepted and no extensions will be granted for any reason. There will be no make-up assignments. If you are absent on any day, be sure to check to see if there is an assignment due at the next class, you will still be expected to turn in the assignment.

**Exams:** There are 3 exams scheduled. (See outline for dates) These will be closed book exams. You are expected to take the exams on the scheduled date. **NO MAKE-UP EXAMS WILL BE GIVEN FOR ANY REASON.** If you miss one exam and document a verifiable emergency that physically prevented you from being in class, the grade on the final exam will be substituted for the grade on the missed exam. If you have taken all scheduled exams, you may substitute the grade on the final, if it is higher, for the grade on the single lowest exam. If you miss 2 exams, you will have a grade of 0% for the second regardless of the reason. There will be a comprehensive final. The date is noted on the outline. Exams will be heavily based on the homework problems. You must do these problems to do well on the exams.

**Withdrawal Policies** – Please see the SMC website to find the school withdrawal policy. As of this semester it is entirely up to the student to withdraw themselves from a course, the instructor is no longer part of the process. It is not my responsibility to remind you of the withdrawal dates and deadlines.

**Evaluation:** Your final grade will be determined by the following:

- 3 Exams - 60% (20% each)
- Projects and other collected work (not online computer homework) - 10%
- Online computer homework 5%
- Final Exam - 25%

I do not curve grades. The final grades will then be assigned by your final average: 90 – 100% = A; 80 – 89% = B, 70 – 79% = C, 60 – 69% = D, below 60% = F

I will not deviate from this system for any reason, please do not ask me to. The grades will not be curved other than the possible replacement of the lowest by the final as outlined above. I will not make deals or take your personal situation into account when assigning grades. This includes, but is not limited to your transfer status, GPA, graduation status or any other personal reason you can think of. There will be no extra credit in this class.

**Academic Honesty:** The academic honesty policy of Santa Monica College will be strictly enforced. If there is any evidence of academic dishonesty on any exam or graded work, all parties involved will receive a grade of 0% for the entire exam or graded assignment, regardless of who did the original work and how much of the exam or assignment was involved. This 0% cannot be the exam grade dropped. It will count toward your final average. A report of Academic Dishonesty will be filed with the school. Please note that it is considered academic dishonesty to have ANY unapproved electronic device out (whether active or inactive) during an exam. Academic dishonesty is not limited to this, please see school policy for details.
Disabilities: Working with the disabled student center, I will make accommodations for disability related needs.

Withdrawal

Students are responsible for their enrollment status in all SMC classes. If you intend to withdraw (earn a W grade) it is entirely the responsibility of the student to handle the withdrawal by the necessary date. Please see the SMC website for all dates and deadlines. If you miss the withdrawal deadline, you will receive a grade in this class. The instructor is no longer involved in the withdrawal process, please be sure you are aware of all dates and deadlines.

Comments:
1. Get to know each other
2. Ask questions. If you do not understand something, ask as soon as possible. I welcome questions during class. You may also ask for help before class and during the break.
3. Make frequent use of the math lab. This is a useful way to get questions answered. It is FREE!
4. Keep up. I cannot stress this enough. The material is cumulative and if you fall behind, it is very difficult to catch up. You should expect to do 1 – 2 hours of homework for every hour spent in class.
5. It is expected that your cell phone, pager, watch and any other noise making device will be turned off before class. If your device goes off during class you will be asked to turn it off, please do not take this as an opportunity to check your messages. If your device goes off during a quiz or exam, your exam or quiz will be collected and you will forfeit all remaining time on the quiz or exam. You will not be given any extra time to complete the exam, you will not be given a chance to make up the exam. A report of academic dishonesty will be filed.
6. Plan to attend class and turn in all collected work on time.

FINAL EXAM: Tues., June 9, 12 noon – 3 p.m. Everyone will be expected to take the final at the scheduled time. Accommodations will be made only for documented unavoidable EMERGENCY situations. Accommodations will not be made for convenience, travel plans (including airline tickets, so purchase accordingly), and around other exams. Plan accordingly.

Math 54

Student Learning Outcome(s):

1. Given a data set, students will analyze the data set and design a presentation of the information using tables, graphs and statistical calculations.
2. Given sample data, students will decide on and use appropriate estimation strategies to make inferences about the important characteristics of population data, including the mean, proportion and variation.
3. Given sample data, students will decide on and use an appropriate test to reach conclusions about a hypothesis made about a population parameter.
Exit Skills:

A. Summarize and interpret data.
B. Analyze and interpret graphical presentations of data.
C. Find and interpret measures of central tendency and dispersion
D. Solve basic probability problems
E. Analyze and interpret probability distributions.
F. Formulate test, and interpret a hypothesis made about one-population parameters
G. Solve basic probability problems
H. Formulate, test, and interpret a hypothesis made about the difference between the means and proportions of two populations.
I. Formulate and analyze point and interval estimates for the difference between the means and proportions of two populations.
J. Formulate test, and interpret a hypothesis of independence between two variables.
K. Formulate test, and interpret for equality of three or more population means using ANOVA.
L. Find and interpret the correlation between two variables.
M. Find the regression line, interpret associated values in context, and evaluate the goodness of fit of the regression model.
N. Use the calculator and/or statistical analysis software to effectively implement the above objectives.

Entry Level Skills: Skills you need to have known prior to enrollment in this course

1. Solve linear and non-linear equations.
2. Simplify advanced numerical expressions (order of operations.)
3. Plot and interpret points on Cartesian coordinate system.
5. Translate verbally stated problems into appropriate mathematical forms.
6. Solve absolute value equations and inequalities in a single variable.
7. Evaluate an exponential function.
8. Solve literal equations for designated variables.
9. Evaluate complex numerical expressions.
10. Given the description of a line, write the equation of the line.
11. Express the solution to an inequality using interval notation.
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<tr>
<th>Week</th>
<th>Tuesday</th>
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<tr>
<td>1</td>
<td>2/17 Intro, 1.1-1.3</td>
<td>2/19 1.4-1.6, 2.1</td>
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<td>2</td>
<td>2/24 2.2-2.3</td>
<td>2/26 2.4-3.1</td>
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<td>3/3 3.2-3.3</td>
<td>3/5 3.4-3.5</td>
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<td>4</td>
<td>3/10 Finish chapter 3</td>
<td>3/12 Chapter 5 material</td>
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<td>5</td>
<td>3/17 EXAM 1</td>
<td>3/19 No Classes –Institutional Flex Day</td>
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<td>6</td>
<td>3/24 Finish Chapter 5, 6.1, 6.2</td>
<td>3/26 6.2, 7.1</td>
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<td>7</td>
<td>3/31 7.2-7.3</td>
<td>4/2 Catch-up, start ch. 8 if time</td>
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<td>8</td>
<td>4/7 8.1, 8.2</td>
<td>4/9 EXAM 2</td>
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<td>9</td>
<td>4/21 Finish 8, 9.1 – 9.2</td>
<td>4/23 9.3 (if time) – 9.4</td>
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<td>10</td>
<td>4/28 10.1 – 10.2</td>
<td>4/30 10.3 – 10.4 (if time)</td>
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<td>11</td>
<td>5/5 Finish chapter 10, 11.1, 11.2</td>
<td>5/7 11.2 – 11.3</td>
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<td>12</td>
<td>5/12 13.1, review</td>
<td>5/14 EXAM 3</td>
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<td>5/19 12.1</td>
<td>5/21 Catch-up</td>
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<td>5/26 12.2,4.1</td>
<td>5/28 4.1</td>
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<td>15</td>
<td>6/2 4.2, 14.2</td>
<td>6/4 Catch-up, Project Presentation</td>
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<td>16</td>
<td>June 9 <em><strong>FINAL EXAM</strong></em> 12-3 p.m..</td>
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**Disclaimer:**
All information in this syllabus is subject to change, including, but not limited to lecture material and exam.quiz dates. All changes will be announced and students are responsible for knowing all changes.
Assignment #1 - 10 points

The textbook comes with an eight page card with formulas and tables. You will need a copy of this card to use on all exams. The copy will be kept in my office and will be brought to each exam for you to use. You must turn in a copy of this card by Feb. 26 at the beginning of class, the original of the card will not be accepted. This is to be kept with you for use at home. You may turn it in sooner of course. There are several ways to get a copy of the card:

1) If you purchase a new textbook, the card will be included.

2) A copy is provided on line after you register or the online website My Math Lab. Look under the "Tools for Success" tab.

3) There is a link to a copy of the card on the course homepage.
   Go to: http://homepage.smc.edu/edinger_gail/
   And follow the math 54 link.

You may print the pages in any form you like - double sided, single sided, etc. Then staple the pages and put your name on the packet. Only stapled and labeled pages will be accepted. Note paper clips, folded corners, folders, and any other fastener than a STAPLE will not be accepted. To earn the 10 points you have to have everything properly prepared!
Small Statistics Project – DUE March 31 at the beginning of class – 30 points

For this project, you will work groups of 2 to 4 on the assigned topic. What you turn in will be a report on your topic. Your report should be typed and should use clear concise English. You should present graphs or charts in the body of your report but put your data in an appendix. Be sure to cite any sources you used, including stores. Give the name and rough address, for example Ralphs on Main Street in Santa Monica. Describe your sampling method and target population as well as any biases inherent in your sample. The description and implementation of the sampling method are an important part of this project. There is no required length to the project, simply complete the assignment to the best of your ability. Feel free to discuss your progress with me or submit work early for feedback. Your work should be typed and in essay form.

You must complete this project in groups of 2 – 4. Projects submitted by individuals or by groups of more than 5 will be accepted, but will be subject to an immediate 15 point penalty (50%) for failure to follow directions.

Choose one of the following.

1. Go to a local grocery store and collect data for at least 20 different soups from EACH of two major soup makers: for example, Campbell’s & Progresso. (This means a total of at least 40) For each of the soups, record the per-serving amounts of calories, fat, and sodium. Calculate the mean, median and standard deviation for each of the variables. For at least one of the variables, construct a histogram of the data for each of the brands. Provide a written conclusion about the similarities and differences between the brands.

2. Go to a local grocery store and collect these data for breakfast cereals: name, grams of sugar per serving, and shelf location (bottom, middle, or top). Use at least 15 cereals from each location. (This means a total of at least 45.) Group the data by cereal location and use three box plots to compare sugar content by shelf location. Also calculate the mean for each of the locations. Comment on your findings.
Major Statistical Project – 100 points

This assignment will not be accepted late. While it is not required, it is strongly suggested that you meet with me prior to turning in the sample plan to discuss your proposed project.

This project will be completed in groups of two to four. As with the first project, projects submitted by individuals or groups of more than 4 will receive an immediate deduction of 50 points for failure to follow instructions. You DO NOT have to use the same groups as for the smaller project.

Choose a population and a response variable to study. **The response variable must be numeric at the ratio level.**

**Part I: Sample Plan** (15 points) **DUE DATE: April 23, 2015** at the beginning of class.
Discuss the population and the response variables you have chosen and why they were chosen. Discuss in specific how your data will be collected. I need to know exactly what you will do to get your data. Since there are usually some biases in the collection methods, discuss any inherent to yours. If your collection method includes a questionnaire, it should be designed and turned in at this point. If you are working in a group only one copy of the sample plan needs to be turned in and it should outline the expected contributions for each group member. You must choose at least 35 data points for each variable in your sample. This may not be turned in late for credit.

**Part II: Final Project** (60 points) **DUE DATE: May 21, 2015** at the beginning of class.
This is the presentation of your work. It should include and will be graded on the following:

1. Introduction (background, purpose,…) (5 points)
2. Sample Plan—a copy of part I, a discussion of its success and any changes you made or know now that you should have made. (6 points)
3. Calculations: (mean, median, mode, standard deviation, calculated.) 12 points
4. Graphs (histogram) (4 points)
5. Confidence Interval (a 95% confidence interval of your mean) 4
6. Discussion – Explain the results of your investigation. What do your graphs and calculations and confidence interval tell you? What are the implications of your work? Did you learn anything interesting? What else would you have done if you had time? Presentation of data and readability graded here also. This should be in full sentences and proper paragraphs. Do not just list your results, I am looking for an explanation and discussion of the results. (21 points)
7. Neatness (4 points) – must be typed.
8. Organization (4 points)

**Part III – Oral Presentation** (5 points)
The group will give a short oral presentation of your work to the class. See outline for date.

**Extra (up to 20 points)**
Note that doing the basic work for one response variable will earn up to 85 points. (80 points if you choose not to do the oral.) To earn a higher grade extra work must be done. This could be relevant research into the population, extra response variables (they need not be numeric, although they must be analyzed to receive credit for completion), a hypothesis test relevant to the material, anything that you think would be relevant. Any extra work must be fully discussed in the discussion and sample plan. The number of points awarded will be at my discretion and related to the amount and accuracy of the extra work done.

**Group Guidelines**
1. Each group member should contribute. There should be regular group meetings.
2. Each group member should understand and be able to answer questions on any part of the assignment
3. Each group member will individually submit a summary of their contributions and the contributions of the other group members. While I hope to assign all of the group members the same grade, that decision will be based on the summaries. There will be a deduction of 5 points per summary for each one missing from the entire group grade.
Math 54 – Project guidelines

1. Be sure to read the project requirements in the syllabus and carefully note the due date. I will not under any circumstances accept late projects. The projects are due at the beginning of class on the due date. Any problems you encounter getting your project in (illness, computer problems, etc.) are NOT excuses or reasons for late projects. You may turn your work in early to avoid worrying about late projects.

2. There is no specified length for the project. I have had great projects that were only a few pages long and some that were 50 pages long. Likewise, I have had not so great projects that were only a few pages long and some that were 50 pages long. They will be read and evaluated on their own merit, not on their length.

3. The work you turn in should be neatly typed and well organized. Only the graphs may be drawn neatly by hand. It should be written so someone with a reasonable knowledge of statistics can understand what your project is about. This means the project will include a combination of prose, graphs, and calculated values. There should be discussion of the graphs and calculations, this does not mean explaining how to find a mean or standard deviation, you can assume the reader knows this. You should be interpreting these numbers. The prose is a VERY important part of your paper.

4. Your paper should begin with an introduction. This should explain what you are doing and why you are doing it, what you hoped to learn or explore with the project.

5. What should follow is a revised sample plan. For some of you this will be very close to the original that was graded all ready. The revised plan should include and changes that you made to the original plan and an explanation of why you made the changes. It might also include and other changes that you would now make if you could do the project all over again.

6. The main part of the paper will be the discussion. Here you will include your calculations, graphs and explanations of what you found. I am not looking for a listing of the data. I am looking for an explanation of the data and what it tells you. Do not tell me how to find a mean or standard deviation, tell me what a mean or standard deviation tells you. I am looking for a discussion of what you found out and why the data supports this. It might be the hypothesis you outlined in the introduction, or perhaps is showed you something you didn’t expect. Your discussion should include any other information you think the reader needs to understand the data.

7. The graphs can be included throughout the discussion or appended at the back and referred to in the discussion. (Give page numbers if they are at the back)

8. The original data set should be appended at the back. You do not need to list the original data set in the discussion.

9. If you do extra work, it too needs to be part of your introduction and discussion. You will not get credit for extra data that is not analyzed. You do not need to do every calculation that is mentioned in the syllabus for the extra work, just what you think is most relevant to your paper.

10. Your paper should include a closing paragraph.

11. This should be in essay form. Although the original assignment is numbered in the syllabus, put your work in paragraph form. DO NOT list the numbers in your paper. This project is a discussion of the data, not a series of answered questions.

12. Don’t forget the due date; I will under no circumstances accept a paper after the class on the due date. Please do not even ask.
Finally some project advice:

1. We will discuss the project at various points during the semester, please listen carefully.
2. It is advisable to form a group with three or more, that way if one group member drops the class you still have a group. Four seems to work well.
3. Under no circumstances may anyone work alone, please don’t even ask. I have never said yes.
4. The group should sit down and discuss communications, meeting times and deadlines before the project begins. It is difficult for a group to work well unless these things are clear. Remember to meet your deadlines and be a good group member. At the end of the project each group member will turn in a private sheet describing the work done by each group member, points could be deducted from individuals that do not fully participate.
5. Begin by discussing what your target population will be. We will discuss examples in class. Then choose your one main numeric question. This is an important starting place.
6. For the extra work, if you choose to ask additional questions, limit the total number of questions to 4 or so. More than that people aren’t interested in taking the time to answer. Be sure that your questions are easy to answer and have clear, easy to analyze responses.