

Math 1040-50	Elementary Statistics	Fall 2009	R. Reimer
NIB 133	M 7:30 – 10:00 p.m.	3 Credit Hours	reimer@dixie.edu
CRN 23621	Office Hours: NIB 133 M 6:45 – 7:30 p.m.		(435) 467-1153

Prerequisites: C or better in Math 1010 AND/OR 23 or higher on ACT

Required Text: Larson, R. & Farber, B. (2009), *Elementary Statistics* (4th ed.).
Dretzke, B., McLaughlin, K. & Wakefield, D. (2009) *Technology Manual for Elementary Statistics* (4th ed.). NJ: Pearson Prentice Hall.

Required Materials: Text, TI-83 or TI-84, internet access and Blackboard Vista, access to EXCEL

All classes in mathematics at Dixie College support the general education goal of the college. Each class will:

- o Require students to perform mathematical processes including fractions, percentages, decimals, proportions/ratios, algebraic equations and/or calculus techniques.
- o Provide students with application problems that use a variety of methods including arithmetical, algebraic and geometric methods.
- o Challenge students to make inferences from mathematical models that include formulas, graphs and tables.
- o Provide students with real-life applications that use a variety of mathematical functions.

The purpose of this course is to introduce the basic principles and theories of statistics to students. As a result of successful completion of this course, a student will be able to:

- o Understand descriptive statistics such as mean, median, mode, and standard deviation.
- o Use and interpret graphs representing data.
- o Identify the properties of normal distribution.
- o Construct confidence intervals and determine sample sizes.
- o Use statistical techniques to test hypotheses.
- o Analyze data using correlation and regression.
- o Use computer program and/or calculator to perform statistical calculation, organize data, and construct graphs.

Available Resources: As a student at Dixie State College, you have access to several helpful resources:

- **Library** (<http://library.dixie.edu/>)
- **Computer Lab**
- **Disability Resource Center** - Provides services and accommodations to students with disabilities (<http://new.dixie.edu/drcenter/>)
- **IT Help Desk** - We provide support for the following: Blackboard Vista, Dmail, wireless, software resources for students, and student laptop lease program (<http://new.dixie.edu/helpdesk/>)
- **Online Writing Lab** - Many writing classes utilize this site. Among other things, students can use the Online Writing Lab to submit papers electronically to the Writing Center (<http://dsc.dixie.edu/owl/>)
- **Testing Center** (<http://new.dixie.edu/testing/>)
- **Tutoring Center** - Free and open to all students. Improve your study skills and clarify concepts and class material (<http://dsc.dixie.edu/tutoring/>)
- **Writing Center** - "Our mission is to help you become a better writer by approaching your assignments as a process of invention, writing, and revision" (http://new.dixie.edu/english/dsc_writing_center.php)

Important Dates: Please see <http://new.dixie.edu/reg/?page=spring2010> for important dates.

A student who misses the first class period without contacting the instructor may be dropped from the class.

Final Exam: The final exam will be given in class on Monday, May 3rd. It may not be taken early.

Academic Discipline: If cheating or disruptive behavior occurs, the instructor will follow academic discipline procedures 34.1 & 34.2, as explained at <http://www.dixie.edu/humanres/policy/sec3/334.html>

Dmail: Important class and college information will be sent to your Dmail email account. This information includes your DSC bill, financial aid/scholarship notices, and notification of dropped classes, reminders of important dates and events, and other information critical to your success in this class and at DSC. All DSC students are automatically assigned a Dmail email account. If you don't know your user name and password, go to www.dixie.edu and select "Dmail," for complete instructions. You will be held responsible for information sent to your Dmail email, so please check it often.

Policies and Statements can be found at <http://new.dixie.edu/reg/syllabus/>

- Academic dishonesty / Academic integrity policy
- Disruptive behavior policy
- Absences related to college functions
- Reasonable Accommodation:

If you are a student with a medical, psychological or a learning difference and requesting reasonable academic accommodations due to this disability, you must provide an official request of accommodation to your professor(s) from the Disability Resource Center within the first two weeks of the beginning of classes. Students are to contact the center on the main campus to follow through with, and receive assistance in the documentation process to determine the appropriate accommodations related to their disability.

You may call (435) 652-7516 for an appointment and further information regarding the Americans with Disabilities Act (ADA) of 1990 per Section 504 of the Rehabilitation Act of 1973.

Our office is located in the Student Services Center, Room #201 of the Edith Whitehead Building.

Grading: Grades will be based on the total amount of points earned. Exams are worth 100 points (3), labs are worth 50 points (4), homework assignments are worth 10 points per class period (13) and attendance is counted at 5 points per class period (if you come late or leave early, you will receive 3 points). Assignments passed off in the next class period will receive 10 points (completion), after that they will receive 5 points. Assignments will not be accepted after the exam for the chapter has been returned to the student. Quizzes will be given every week (online) and will be worth 10 points. For assigning grades, standard percentages will be used:

Cutoff for: A 94% A- 90% B+ 87% B 83% B- 80% C+ 75%
 Cutoff for: C 70% C- 65% D+ 60% D 55% D- 50%

Course Outline

Wk 1	January 11	Chapter 1	1.1 1~6, 7~37 e.o.o. 1.2 7~23 odds 1.3 1, 6, 8, 11~15, 29, 30
January 18 No School			
Wk 2	January 25	Chapter 2	2.1 9, 11, 13, 17, 23, 27, 33 2.2 9, 11, 17, 21, 23 2.3 1~49 e.o.o.
Wk 3	February 1	Chapter 2	2.4 7~13 odds, 14, 17, 21, 29, 31 2.5 11, 21, 23, 27, 31, 37 LAB 1 Due
Wk 4	February 8	Chapter 3	3.1 1, 5~15 odds, 25, 27, 29, 43 3.2 1, 15, 19, 23 3.3 1~19 odds EXAM 1 Free Response Distributed; Multiple Choice Online
February 15 No School			
Wk 5	February 22	Chapter 4	4.1 9~31 odds, 37, 45 4.2 7~19 odds, 25
Wk 6	March 1	Chapter 5	5.1 9~21 odds, 35, 45 5.2 5, 9, 11, 23~29 odds Deadline to enter data for Lab 2
March 8 No School			
Wk 7	March 15	Chapter 5	5.3 5~17 e.o.o., 39, 41 5.4 17, 21, 25, 27, 35, 37 Deadline to enter data for Lab 3
Wk 8	March 22	Chapter 6	6.1 31, 37, 39, 41, 51, 55a 6.2 13, 15, 17, 23, 25 LAB 2 Due
Wk 9	March 29	Chapter 6	6.3 1~19 odds, 23 6.4 1~15 odds EXAM 2 Free Response Distributed; Multiple Choice Online
Wk 10	April 5	Chapter 7	7.1 1~7 odds, 23~29 odds 7.2 1, 3, 5, 39, 41, 43 Deadline to enter data for Lab 4
Wk 11	April 12	Chapter 7	7.3 19~27 odds 7.4 1~13 odds LAB 3 Due
Wk 12	April 19	Chapter 9	9.1 15, 19, 25, 27 9.2 13~19 odds
Wk 13	April 26	Chapter 10	10.1 9, 11, 13, 15 10.2 17, 19 10.4 7, 9 EXAM 3 Free Response Distributed
May 3 Final Exam (Exam 3 Multiple Choice) in Class at 7:30 p.m. Lab 4 Due			

The course outline is tentative. Changes will be announced in class and/or via e-mail and/or on Blackboard Vista. Students are responsible for all changes. The exercises listed are the minimum requirements for minimal mastery. You may wish to complete more exercises than those that are given in order to understand the concepts better.

PERSONAL INFORMATION ASSIGNMENT

To enter your information into the online form, go to:

<http://spreadsheets.google.com/a/schsmail.net/viewform?hl=en&formkey=dElyYUhfD1JzVDRyXzVqOG5qbDN1ZIE6MA>

or follow the link from Blackboard Vista (Web Links).

This form must be completed by January 15, 2010. It is worth 10 points.

LAB GENERAL INFORMATION

You do not need to wait to gather the data for each lab (2 – 4). These forms are available the first day of class (see Blackboard Vista Web Links) and will be available until the “closing date” listed in each lab’s instructions. The spreadsheet will then be made available to you via Blackboard. Please make certain that the data you provide is accurate data. In order to be meaningful, you cannot “make up something.” Your grade for the lab will be based on 1) completion of the data gathering, 2) completeness of the lab requirements and 3) articulation of the response/analysis. The letter in each case should be very formal.

LAB NUMBER ONE

DUE FEBRUARY 1
50 POINTS

DATA COLLECTION and PRESENTATION

Write a survey of your own (a topic that interests you) with a minimum of five questions. For the write up of this survey, include the following. The lab that you turn in should have six sections (clearly labeled).

1. **INTRODUCTION.** Explain why the topic is important to you. Explain the population that you are surveying. Explain how a sample would be obtained. Explain how you would eliminate bias from the sample. Do not actually carry out these steps, but explain using the topics discussed in Chapter One of the text book.
2. **CREATION PROCESS.** A summary of *the process* of creating the survey questions including how you eliminated bias from the questions and “re-created” the questions to meet your needs. This is the first, second, third, etc. draft of the survey.
3. **SURVEY.** An actual formally presented survey – this is the “final draft.”
4. **SURVEY SAMPLE.** A sample of the survey responses and a write up of your notes. Give the survey to five people. Have them answer the questions and make note of what needs clarification or ways that people answered that were different than your intent. The people that you survey do not need to be a part of your population or sample. Ask them if they feel like the questions are biased or unclear and make note of their response.

5. LETTER. Write a letter to the “president of the company” as if you were hired to gather the data that you created in the survey and base your recommendations on the responses that you received in part 4. It should include at least two charts and/or graphs.
6. SUMMARY. A summary of the data collection process including your thoughts. What did you expect? Did the results meet your expectations? What was easy about the process? What was difficult about the process? What would you have done differently? What did you learn?

Here is a helpful hint: If you are writing the introduction, creation process and summary on the same day, you are not “getting it” (i.e. following the idea/objectives of the lab). The point (objective) is to keep track of the *process of information collection* including *what* data is collected and *how* it is presented.

LAB NUMBER TWO

DUE MARCH 22
50 POINTS

NORMAL DISTRIBUTION and CONFIDENCE INTERVALS

1. Contact an owner or manager of a business in town. Ask the manager/owner how much they would be *willing* to spend (not necessarily *what* they spend) for a web site for their company/business. Let them know that this is for a statistics project and that neither their name nor their company name will be used in the data for the class. “Spend for a web site” is vague and can be interpreted to mean a one-time website setup (not maintenance, updates, etc.) – not that you personally would do it, but what they would be willing to pay for it to be done. Also, there are all kinds of issues with size of company, product, etc. in relation to the amount that they would be *willing* to spend. For the purposes of this lab, we will not be worried about these technicalities. When you enter the data into the form, you will need to enter your name, the company name, the name of the person that you contacted and the amount that they would be willing to spend. If you have too much trouble getting all of this information for a business or company, you may wish to consider changing the business.
2. Go to <http://spreadsheets.google.com/a/schsmail.net/viewform?hl=en&formkey=dHJyTXJxR3dZcmRMSHhjZFFBVTJRU0E6MA> to enter the data (this link can be found on Blackboard Vista) by March 1.
3. After March 1, the completed data set will be available on Blackboard Vista. I will take off the company name for class use.
4. Hand in a completed lab that contains:
 - a. DATA SET. A copy of the data set
 - b. STATISTICS. The sample mean, median, number in the data set and standard deviation. Construct a 95% confidence interval and a 99% confidence interval for the data. Interpret the results.
 - c. LETTER. Write a letter to the “president of the company” – you don’t need to send the letter to them, it is just for the purposes of this lab – with the results of your analysis and a recommendation.

LAB NUMBER THREE

DUE APRIL 12

50 POINTS

HYPOTHESIS TESTING

A claim is made that teenage males drink fewer than three 12-oz servings of soda per day.

1. Randomly select two teenage males. They should be kids that you do not personally know and at different times. Ask each one his initials, age, and how many 12-oz servings of soda he drinks each day. Record this information.
2. Go to <http://spreadsheets.google.com/a/schsmail.net/viewform?hl=en&formkey=dFlabkVua3l3QnFDd05leXZXQUxDZmc6MA> to enter the data (this link can be found on Blackboard Vista) by March 15.
3. After March 15, the completed data set will be available on Blackboard Vista.
4. Hand in a completed lab that contains:
 - a. DATA SET. A copy of the data set.
 - b. STATISTICS. The sample mean, the median, the number in the sample and the standard deviation. List the null and alternative hypotheses. Is the claim supported at a 5% significance level? At a 1% significance level?
 - c. LETTER. Write a formal letter to the president of the board stating whether the claim can be supported with the data or not. Include your statistics and recommend a course of action based on the claim.

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LAB NUMBER FOUR

DUE MAY 3

50 POINTS

REGRESSION and CORRELATION

1. Find the age (in months) and the height (in inches) of two people between 1 and 18 years old (male and female)
2. Sometime when you are driving (someone else could do this for you), measure the distance from and the time it takes to get to the NIB.
3. Go to <http://spreadsheets.google.com/a/schsmail.net/viewform?hl=en&formkey=dGRDRkdJbTNIWGtwcUtlEE3a1VTbWc6MA> to enter the data (this link can be found on Blackboard Vista) by April 5.
4. After April 5, the completed data sets will be available on Blackboard Vista
5. Hand in a completed lab that contains (for each of the three data sets):
 - a. SCATTERPLOT. A scatterplot (age is the independent variable, height is the dependent variable) of each data set
 - b. REGRESSION. A linear regression equation for the data ($y = mx + b$)
 - c. CORRELATION. A correlation coefficient for the data
 - d. SIGNIFICANCE. Is there enough evidence at a 1% significance level to conclude that there is a significant linear correlation between the data (for each data set)? Show your work.
 - e. ANALYSIS. A brief analysis paragraph: Choose one person (male or female) that is between the ages of 1 and 18 (different person than you used for the data). According to the regression equation is this person the same as, above or below our estimated height for the age and gender?