

Math 14, Introduction to Statistics

Shasta College, Fall 2012, Section F3691

Course: Math 14, Introduction to Statistics
TTh, 12:30 to 2:20 pm
Room 1109
4 Credit Hours

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Office Hours: TTh: 9 to 10 am
MWF: 10:00 to 11:00 am

1. **Catalog Description.** An introductory course in statistics designed to show the role of modern statistical methods in the process of decision making. Concepts are introduced by example rather than by rigorous mathematical theory. The following topics will be covered: measures of central tendency and dispersion, regression and correlation, probability, sampling distributions including the normal, t, and chi-square, statistical inference using confidence intervals and hypotheses testing. This course may be offered in a distance education format.

- (a) Pre-requisite: A grade of C or higher in MATH 102, or Math Placement Level 4 or higher.
- (b) Advisory: A grade of C or higher in ENGL 190 or English Placement Level 6 or higher.

2. Course Objectives.

Upon successful completion of this course, the student should be able to:

- (a) Organize statistical data.
- (b) Find the 5-number summary, mean and standard deviation of a data set.
- (c) Find the probability of an event.
- (d) Find the probability of a compound event consisting of independent, dependent or mutually exclusive events.
- (e) Compute probability of an event using the binomial and normal distributions.
- (f) Test hypotheses about sample means and difference of two sample means using the normal distribution and large sample theory.
- (g) Test hypotheses about sample means and difference of two sample means using the t-distribution and small sample theory.
- (h) Find confidence intervals for population means and population proportions.
- (i) Use CHI-square distribution to test hypotheses concerning contingency tables and "goodness of fit."

- (j) Find the linear-regression of a variable upon another variable.
3. **Student Learning Outcomes.** Upon successful completion of the course, a student should be able to accurately apply steps of problem solving to solve a problem as follows:
- (a) Demonstrate understanding of the problem.
 - (b) Choose an appropriate problem-solving strategy.
 - (c) Effectively solve the problem using the chosen strategy.
 - (d) Clearly state the correct solution to the problem.

Example. Conduct a large sample test of hypothesis for the population mean.

Sample Problem:

Conduct a large sample test of the mean. A real estate agent believes that the average closing costs for purchasing a new home is more than \$6500.00 . She selected 40 new homes at random and found the mean closing cost to be \$6598.75 with a standard deviation of \$512.00. Perform a test of hypothesis at $\alpha = 0.05$ to decide if the evidence supports her belief.

- (a) State the null hypothesis H_0 and the alternate hypothesis H_1 for the test.
 - (b) Draw a sketch showing the normal curve, the boundary or critical value, and the critical region for the test.
 - (c) Compute the Test Statistic OR compute the p-value for the test. Clearly label which measurement you have computed.
 - (d) What is your decision about the null hypothesis based on your answers in 1-3?
 - (e) Is the real estate agent correct in her belief that average closing costs are more than \$6500.00? Explain.
4. **Assigned and Recommended Text and Materials.**
- (a) **Required Text.** “*Elementary Statistics, 4th Edition*” by Allan G. Bluman, ISBN-13: 978-0-697-78633-3.
 - (b) **Required Materials.**
 - i. The “Required Text”.
 - ii. Paper, pencil, eraser and notebook. I would suggest a 3-ring binder, but the choice is yours.
 - iii. TI-84 or TI-Inspire calculator.
 - iv. www.SumOfCubes.weebly.com
 - v. The Math Lab, located in the 700 Building has a reserve copy and solutions manual available.

5. **Statement of Instructional Methods.**

- (a) **Success.** Come to class ready to participate, take notes, and ask questions. Each class period will begin with an open session to review homework. This is your chance to ask questions regarding the assigned homework.
Be prepared for class by bringing all required materials and having completed or at least attempted homework assigned in the last class.

Find a study partner. You will find that the more you talk, write and see math, the better and easier it is to learn and remember.

If there is one piece of advice that works best, it is: “Repetition is the mother of all learning.” The more you see strategies to solve and utilize what you have learned, the easier the next concept becomes. I will show you how to solve and work in the math environment, and it may appear easy. But, at some point you need to do it on your own, without my guidance, to really “own” the concept.

Office hours are for the student, not the professor. Office hours are your time to ask me questions. If you are struggling with homework or something we did in lecture and you have a question, please come ask. Sometimes a little one-on-one help is all you need. My office hours are on the top of the first page, but if I’m in the office, and the door is open, you are welcome.

Shasta College staffs a full-time **Math Business Learning Center**. It is a place to get free math tutoring. It is staffed with helpful math tutors who like to talk math and are there to assist you. Put them to work and keep them busy. In addition to the tutors are videotapes, software, and solutions manuals. The Math lab is open **Monday-Friday**.

- (b) **Note.** This syllabus is subject to change by the instructor. Any changes will be announced in class and are the responsibility of the student.

6. Course Content.

- (a) Organization of data
- (b) Mean, median and standard deviation
- (c) Probability
- (d) Binomial and normal distributions
- (e) Confidence intervals
- (f) Hypotheses testing using large sample theory
- (g) Hypotheses testing using small sample theory
- (h) Regression and correlation
- (i) CHI-square distribution and its use

7. Grading Policies.

- (a) **Exams.** There will be 4 exams and a final exam. Exam dates will be announced in class at least one class prior to the exam. Exams will comprise both written and multiple choice questions. Your lowest exam score will be dropped in determining your class grade. If you must miss a class for any reason, and your absence causes you to miss an exam, that is the exam you drop. *There are no make-up exams.*
- (b) **Final Exam.** The final exam is mandatory and is not dropped in calculating your grade. The final exam will only be administered on Thursday, December 20th from 1:00 to 3:00 pm.
- (c) **Grading.** Grades will be posted online. You may view your grades at any time via SumOfCubes.com or via GradeSource.com. You will need a secret code to discern which grade is yours. If you would like to utilize this resource, make sure I have your correct email address.

Exams (drop the lowest)	75%
Final Exam	25%
<i>Total</i>	100%

Grade Scale	
90% ≤	A
80% ≤	B < 90
70% ≤	C < 80
60% ≤	D < 70
	F < 60

8. Classroom Policies.

- (a) **Electronic Devices.** This is a cell phone free class. All cell phones, blackberries, pagers, iPods, iPads, etc are to be turned off or silent. Students found using such devices during class will receive a zero on the next exam.
- (b) **Email.** Much of an education is the ability to clearly communicate and express ideas; thus, if you choose to communicate with me via email, it must be done using proper English grammar. I will not respond to any emails that are not properly composed.
- (c) **In Class Communication.** If you have a question, please raise your hand and ask. Do not converse with your neighbor during class unless instructed. Disruptive behavior is not appreciated. You will be asked to leave the classroom for the remainder of the class.
- (d) **Guests and Children.** Only authorized persons are allowed in the classrooms. College liability coverage does not extend to guests or children and thus they are not allowed in the classroom. If a student needs assistance with childcare during class time, please contact the EOPS office. EOPS may be able to help with long-term day care; however, it does not provide day-care service on a drop-in basis.

9. College Policies.

- (a) **Academic Honesty:** According to the Shasta College Student Handbook and the Shasta College Catalog, there are a number of unauthorized behaviors that violate the campus academic honesty policy. Each student should become familiar with the policy. Failure to acknowledge the work of other scholars constitutes an egregious breach of ethics and is a violation of civil law. You must, in all cases, do your own work, acknowledge sources, and document them appropriately. Otherwise, disciplinary sanctions will be applied. If you have any questions about plagiarism, please do not hesitate to contact me. In other words, cheating of any sort will not be tolerated and will result in an F for the assignment, quiz, or exam, and the case may be reported to the Dean of Students.
- (b) **Student Conduct and Discipline:** In accordance with the Student Code of Conduct (Board Policy 5500), students are expected to obey all California State laws and all Federal laws that pertain to behavior on a college campus. Shasta Colleges jurisdiction and discipline shall be limited to conduct that occurs on Shasta College premises or that is related to school activities. Any student found to have committed misconduct is subject to the disciplinary sanctions outlined in Board Policy, Section 5520.
- (c) **Dropping:** If a student misses two consecutive weeks of class or more it may be assumed they are no longer interested in the course. School policy notes that these students may be dropped by the instructor either on census day or via the instructor initiated drop

process. Nevertheless, if the student decides to stop attending, it is always the student's responsibility to officially drop or withdraw from the class.

- (d) **Academic accommodations imposed by a disability:** If you feel that you will need academic accommodations in this class due to limits imposed by a disability then contact the office of Disabled Students Programs and Services (DSPS) (242-7790) to make the necessary arrangements. It is the student's responsibility to provide documentation that verifies the disability and the type of limitations that may result. The DSPS office has been delegated the authority to, 1) evaluate that documentation and determine if it is sufficient to justify accommodations, 2) determine which accommodations are appropriate, and 3) facilitate the provision of approved accommodations.

10. **Tentative Schedule.** This class will progress through the book, beginning with Chapter Two. Over the course of the semester, we should cover chapters two through 12 in order. Exam dates will be announced in class at least one class prior to the exam.

Please note that this is a tentative schedule and is subject to change by the instructor. Changes will be announced in class are the the responsibility of the student to be abreast of such changes.