Course Outline

Course: Stat 1:**Introduction to Statistics** **Professor:** Abe Mirza

Office Hours: Thu 3:0 – 3:50 (BRH:121)/MW 10:00 10:50 (online) **MATH LAB:** Free math help **(BRH:118)**

Textbook: **Text: Not Required** (*Introductory Statistics Custom Edition for CSUS*, by Neil A. Weiss)

Catalog Description: Descriptive statistics, basic concepts of probability and sampling with the aim of introducing fundamental notions and techniques of statistical inference. Students will be given periodic writing assignments, which encourage them to express various concepts of the course.

Class website: http://www.csus.edu/indiv/m/mirzaagham/stat/

Email: abemirza@csus.edu ***In emailing me in subject line write stat1***

YOU NEED TO GO TO MY WEBSITE,

1) TO PRINT COURSE MATERIALS
2) **CHECK** THE **ANNOUNCMENT** AND YOUR **CLASS REPORT** ON REGULAR BASIS.

Prerequisites:

Sacramento State will now allow an ALEKS Placement. **To be able to stay in the course you need a minimum score of 51 in the Alex placement test.**

For all necessary information **(**Please see the link on the class website or the link below.)

http://nsm-assessment-test.nsm.csus.edu/DIAG/home.php?d=diag&f=aleks.php

Learning Objectives: Introduce the terminology and methods employed in descriptive statistics. Establish a foundation in the concepts of probability and sampling. Extend these ideas to inferential statistics and various hypothesis tests**.**

Area B-4 Mathematical Concepts and Quantitative Reasoning Student Learning Outcomes. Students will be able to:

A) Solve problems by thinking logically, making conjectures, and constructing valid mathematical arguments.
B) Make valid inferences from numerical, graphical and symbolic information.
C) Apply mathematical reasoning to both abstract and applied problems, and to both scientific and non-scientific problems.

Writing Component: STAT 1 satisfies Area B4 of the GE requirements. Students are advised to practice interpreting the results of statistical analyses using technical and non-technical language while solving assigned word problems dealing with real life situations. Class discussions will emphasize this writing component requirement of the course through the above criterion.

Students will be able to:

A. Solve problems by thinking logically, making conjectures, and constructing valid mathematical arguments.
B. Make valid inferences from numerical, graphical and symbolic information.
C. Apply mathematical reasoning to both abstract and applied problems, and to both scientific and non-scientific problems.

Expectations: I expect that you• Come to class on time and remain the entire time
• Come to class prepared. This includes, but is not limited to, the following: reading the sections prior to class; bringing a calculator to class; keeping up with homework• **Turn off all electronic devices**, except your graphing calculator, during class• Be respectful to others in the classroom• Do all the assigned homework on time• Ask questions when you do not understand

The course is divided into 4 parts.

Part 1	Part 2	Part 3	Part 4
Descriptive Statistics Linear Regression Basic Probability	**Probability Binomial Probability Normal Distribution**	**Central Limit Theorem Estimation**	**Test of Hypothesis**
Q1-Q4	**Q5-Q7**	**Q8-Q11**	**Q12-Q15**
HW1 / Test 1	**HW2 / Test 2**	**HW3 / Test 3**	**HW4 / Test 4**

Required Material: **1.** A two- variable statistics calculator (**TI-83/84 model**) **2**. Regular Graph Paper **3**. A binder

Quizzes: There will be 15 quizzes, each for 10 points. If your absent is unexcused, **absolutely there will not be a make up for missing quizzes.** If you miss a quiz by any unexcused reason, then you will be receiving a **zero score** for that missing quiz.

Homework: All four homework are posted on my web. The due date will be announced in class or will be posted on the announcement link. YOU ARE STRONGLY ADVISED TO DO ALL THE HOMEWORK PROBLEMS. **Absolutely, after the due date no homework will be accepted** If you miss submitting homework on due date, by any unexcused reason, you will be receiving a **zero score** for late homework.

Tests: There will be a total of 4 tests (excluding final) given for the entire semester. All the tests weigh **100 points.** If your absent is unexcused, **absolutely there will not be a make up for missing tests.** If you miss a test by any unexcused reason, then you will be receiving a **zero score** for that missing test. **Only for excused** absences a **make up** test will be given **at the end of last week**.

Final will be comprehensive and will worth 200 points.

Academic Honesty:

Each student is responsible for understanding the policies on academic honesty set forth by CSUS Policies. Any student found in violation of these policies will be held strictly accountable. Please remember that using a "term paper service" or having another student write your paper is plagiarism. Use of the instructor's copy of the text is considered a violation of the academic honesty policy.

Points Distribution **Grading Policy**:

Projects	40 Points	**Grade Distribution**
Quizzes	150 Points	**A** 90.5 - 100%, **A-** 87.5 - 90.4%,
Homework	80 Points	**B+** 84.5 - 87.4%, **B** 80.5 - 84.4%, **B-** 77.5 - 80.4%,
Tests:4@100	400 Points	**C+** 74.5 – 77.4%, **C** 70.5 – 74.4%, **C-** 67.5 – 70.4%,
Final:	200 Points	**D+** 64.5 – 67.4%, **D** 60.5 – 64.4%, **D-** 57.5 – 60.4%,
Total:	**870** Points	**F** 57.4% and below

Final examination:

Class Day(s)	Section	Fall Exam Day	Exam Time
TR	**Section 15 (32918)**	**Thur, May 14**	**12:45- 2:45**
TR	**Section 18 (32706)**	**Thur, May 14**	**3:00- 5:00**

Lecture Video Notes: Optional to earn extra credit. You must watch the videos lessons posted on Lecture videos links on class website and write (type) a summery for each one. They are also ***due on the same day that HW for each part is due.***
Part 1: lessons 1 through 25. For 10 extra credit points. A minimum of 2 pages single-spaced typed
Part 2: lessons 26 through 29. For 5 extra credit points A minimum of 1.5 pages single-spaced typed
Part 3: lessons 30 through 34. For 5 extra credit points. A minimum of 1.5 pages single-spaced typed
Part 4: lessons 35 through 37. For 5 extra credit points. A minimum of 1.5 pages single-spaced typed

Topics covered: Stat 1

I. Descriptive Statistics (3 1/2 weeks)

1. What is statistics?
2. Basic terminology and concepts
3. Graphical presentations of statistical data
4. Frequency distributions, histograms, and ogives
5. Measures of central tendency
6. Measures of variability
7. Measures of position
8. Bivariate data and scatter diagrams
9. Linear correlation
10. Linear regression

II. A Probability (IIA 2 weeks)

1. Experiments, sample space, events
2. Different approaches to probability
3. Probability axioms
4. Rules of probability:

a. generalized addition rule
b. complement rule

5. Conditional probability, independence, and the multiplication rule

* 6. Bayes' rule

II. B Discrete Random Variables (IIB 2 weeks)

1. Random variables and their probability distributions
2. Connection between relative frequency distributions and probability distributions of discrete random variables
3. Mean and variance
4. The binomial probability distribution

* 5. Using the binomial distribution tables; mean and variance of the binomial distribution

III. A The Normal Probability Distribution (IIIA 3 weeks)

1. Continuous random variables
2. The normal distribution
3. The standard normal distribution
4. Normal approximation of the binomial distribution

* 5. Digression: How to MINITAB!

6. Sampling distributions
7. The Central Limit Theorem and its applications

III. B Inference (4 ½ weeks)

1. Introduction to inference - estimation and testing of hypotheses
2. Point and interval estimation
3. Testing statistical hypotheses:

a. Type I and Type II errors
b. Critical regions
c. p - values

4. Inferences concerning one population

a. Tests and confidence intervals for the population mean (large and small samples).
b. Tests and confidence intervals for proportions
c. Inference about the population variance

5. Inferences concerning two populations

a. The differences of two means (large and small samples)
b. Paired t - tests and the pooled t - test
c. The difference between two proportions
d. The ratio of two variances

6. Uses of chi-square statistics

a. Tests of goodness of fit
b. Contingency tables

* 7. Introduction to one-way ANOVA