CALIFORNIA POLYTECHNIC STATE UNIVERSITY
San Luis Obispo, California

STAT 251 - Statistical Inference for Management I **Fall 2015**

1. Catalog Description

STAT 251 Statistical Inference for Management I (4) GE B1
Descriptive statistics. Probability and counting rules. Random variables and probability distributions. Sampling distributions and point estimation. Confidence intervals and tests of hypotheses for a single mean and proportion. 4 lectures. Prerequisite: Completion of the ELM requirement and a passing score on appropriate Mathematics Placement Examination for MATH 221 eligibility, or MATH 118 or equivalent. Fulfills GE B1.

2. Required Background and/or Experience

Completion of the ELM requirement and passing score on pre-calculus MAPE for Math 221 eligibility, or MATH 118 or equivalent

3. Expected Outcomes

The student should be able to:

a. calculate and interpret various descriptive statistics;
b. understand probability concepts and apply probability rules;
c. use elementary counting techniques;
d. apply commonly used probability distributions;
e. calculate and interpret one-sample point and interval estimates of means and proportions;
f. formulate various decision problems in terms of hypotheses tests;
g. understand Type I and Type II errors in hypotheses tests; and
h. conduct one-sample hypothesis tests about means and proportions.

4. Text and References

Text: Sharpe, N., De Veaux, R., and Velleman, P., *Business Statistics,* 3rd ed., Pearson Addison-Wesley,Boston, 2015

References: Groebner, D.F., *et al*, *Business Statistics A Decision-Making Approach*, 9th ed., Prentice Hall, Upper Saddle River, New Jersey, 2013.

Anderson, D.R., *et al*, *Statistics for Business and Economics*, 11th ed., South-Western College Publishing, Cincinnati, OH, 2011.

McClave, J.T., *et al, Statistics for Business and Economics*, 12th ed., Prentice-Hall, Upper Saddle River, NJ, 2012.

1. Minimum Student Materials

None

6. Minimum University Facilities

Chalkboards for class use. Overhead projectors.

7. Method of Evaluating Outcome

Problem assignments, scheduled tests, and final examination.

8. Expanded Description of Content and Method

CONTENT		NUMBER OF LECTURES	
A.	**Introduction and Descriptive Statistics**	**5.0**	
	1. Data and Data Collection	1.0	
	2. Graphical Methods for Data Description	1.5	
	3. Numerical Descriptive Measures	2.5	
B.	**Probability and Counting Rules**		**7.0**
	1. Events, sample spaces, and Probability	1.0	
	2. Compound events and event relationships	1.0	
	3. Additive Rule and Mutually Exclusive Events	1.0	
	4. Conditional Probability and Bayes' Rule	2.0	
	5. Multiplicative Rule and Independence	2.0	
C.	**Random Variables and Probability Distributions**		**5.0**
	1. Discrete random variables and distributions	2.0	
	2. Expected values for discrete random variables	1.0	
	3. The binomial distribution	2.0	
D.	**Continuous Probability Models**		**3.0**
	1. Continuous random variables	1.0	
	2. The normal distribution	2.0	
E.	**Sampling Distributions**		**3.0**
F.	**Single Sample Estimation with Confidence Intervals**		**5.0**
	1. Confidence interval for a population proportion	2.0	
	2. Confidence interval for a population mean	2.0	
	3. Sample size determination	1.0	
G.	**Single Sample Tests of Hypotheses**		**8.0**
	1. Elements of a hypothesis test	1.0	
	2. Hypothesis test for a population proportion	3.0	
	3. P-values	1.0	
	4. Hypothesis test for a population mean	2.0	
	5. Type I error, Type II error, power	1.0	
		TOTAL	**36.0**

METHOD

Largely lecture with chalkboard and transparency illustration of methods and problems, class discussion and supervised work.

9. Method of Evaluating Outcome

Daily problem assignments, scheduled tests and a final examination.