Standard Course Outline
IS 310 Business Statistics I

I. General Information

Course Number:	IS 310
Course Title:	Business Statistics I
Units:	3
Prerequisite:	STAT 118 and Completion of GE Foundation courses and at least one GE Explorations course
Course Coordinator:	Khosrow Moshirvaziri
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Date prepared/revised:	September 17, 2018

II. Catalog Description

IS 310. Business Statistics I - Prerequisite: STAT 118 and Completion of GE Foundation and at least one GE Explorations course. Applications of statistics to business decision making problems. Data collection and organization, probability theory, measures of central tendency and dispersion, hypothesis testing and estimation, simple regression, and correlation. Use of statistical software.

Letter grade only (A-F)

III. Curriculum Justification(s)

Statistical analysis is an integral part of business decision making. While business experience, thoughtful guesswork, and intuition are key attributes of successful managers, real world business problems are too complex for this type of decision making alone. This course is designed to ensure that students are equipped with the tools and techniques of basic statistics--what it is, how and when to apply statistical techniques to decision-making situations, and how to interpret the results attained. At the conclusion of the course, students should be familiar with the function of sampling, probability distributions, t-statistics, z statistics, hypothesis testing about means, proportions, variances, and central tendency and dispersion measures. Emphasis also will be placed upon the use of Spreadsheet-based statistical software packages (MS **Excel** in particular and Excel-based Add-ins tools) as a means for data analysis and interpretation; however, students should become familiar with the necessary rigor involved in calculations prior to using software tools so that interpretation is properly understood.

- This course fulfills the requirements of a **GE Mathematics/Quantitative Reasoning (B2) Area** in several important ways. The discipline of business decision making based on statistical tools brings together all of the key elements of Quantitative Reasoning and essential higher level achievements within Business decision making. At its core, the subject of Business Statistics requires students to analyze, understand, and discuss principles, concepts, and application of statistics in business. Additionally, students learn how to compute various measures of location, dispersion, shape, and their applications in various types of data sets.

- This course is appropriate for **GE Upper-Division B2 Classification**. Upper division general education courses should reinforce knowledge and skills acquired from many areas, and incorporate depth in the form of more sophisticated tools and analysis, if not necessarily in terms of content knowledge. This course will have as prerequisites the entire Foundation curriculum and upper-division standing. This course demonstrably develops advanced business decision making skills utilizing statistical tools., concluding with synthesis and application of knowledge, Inquiry/analysis.

- The content- and skills-based outcomes for this course address advanced concepts of statistical reasoning, problem solving, requiring the use of more sophisticated tools. This includes subjects such as, descriptive statistics: tabular and graphical presentations, numerical measures of location, dispersion, skewness; discrete and continuous probability distributions; sampling and sampling distributions; interval estimation of population parameters; hypothesis testing about means, proportions, and variances. Additional related topics include nonparametric methods such as test of goodness of fit, independence, multiple proportions, linear regression and correlation analysis with an exposure on multiple regression.

In additional to fulfilling CSULB General Education Learning Goals, course content and instruction methods should also be designed to fulfill the following AACSB (Association to Advance Collegiate Schools of Business) undergraduate learning goals, which are required for accreditation. Upon completion of the course, the student will meet the following two specific **CBA Learning Goals**, among others:

- Demonstrate conceptual learning, *Quantitative Reasoning* and *Problem Solving* skills.

- Possess *Quantitative Skills* and *Analytical Reasoning*; enabling them to interpret and critically assess business data to improve overall business performance.

IV. Measurable Student Learning Outcomes, Evaluation Instruments, and Instructional Strategies for Skill Development

This course is intended to introduce higher level statistical tools needed for the collection, processing, analysis, and interpretation of numerical data and various sampling methods to assist business decision making.

The General Education Essential Skills set to include:
Primary:
A. Quantitative Reasoning
B. Problem-Solving, and
C. Inquiry and Analysis
Secondary:
D. Critical Thinking

The above GE Essential Skills are captured in the following Student Learning Outcomes as indicated in parentheses.

- Understand and discuss principles, concepts, and application of statistical tools in business (A, B, C, D).
- Develop an understanding of descriptive and inferential statistics for business decision making (A, C).
- Compute various measures of location, dispersion, shape, and their applications (B, C).
- Utilize the application of various types of data sets in report writing (C).
- Describe the distribution of the data using tabular, graphical, and numerical methods (A, B, C).
- Generate numerical description of data utilizing typical values and percentiles (A).
- Apply the principles and concept of probability to assign probabilities and estimation to experimental outcomes. Understand probabilities associated with various discrete and continuous distributions (A, C).
- Be able to apply the properties of normal probability distribution in business decision-making situations (A, D).
- Demonstrate effective skills in data collection and random sampling (B).
- Estimate population parameters utilizing point and confidence interval estimates (B, C).
- Relate the implication of the statistical applications on various management research projects utilizing hypothesis testing techniques for both single and two population means, proportions, and variances (A, B, C, D).
- Measure the strength and predict the relationship among data variables using covariance, correlation, and regression analysis (A, C, D).

For each General Education Essential Skill listed above, the following identify the measurement instruments/assessments utilized; the course typically requires a minimum of 3 exams and in-class quizzes:

A. Quantitative Reasoning
   o This skill is assessed/measured by designing particular test/exam questions and weekly homework.
B. Problem-Solving, and
   o This skill is assessed/measured by designing particular test/exam questions.
   o This skill is further assessed/measured by weekly homework assignments.
C. Inquiry and Analysis
   o This skill is assessed/measured by designing particular test/exam questions.
   o This skill is further assessed/measured by weekly homework assignments.

V. Outline of Subject Matter

- Data and Statistics.
- Descriptive Statistics: Tabular and Graphical Presentations.
- Descriptive Statistics: Numerical Measures of Location, Dispersion, Skewness (lack of symmetry), and Kurtosis (peaked or flatness relative to normal).
- Overview of Probability Theory.
- Discrete Probability Distributions: including Bernoulli, Binomial, Hypergeometric, and Poisson.
- Continuous Probability Distributions: including Normal, Student's t-distribution, Chi-square distribution, Uniform, Exponential, and F-distribution.
- Sampling and Sampling Distributions.

- Interval Estimation of various population parameters.
- Hypothesis Testing, one population case, about Mean and Proportion.
- Statistical Inference about Means and Proportions with Two Populations.
- Inferences about Population Variances; one and <u>two populations</u>.
- Nonparametric Methods: Test of Goodness of Fit, Independence, <u>Multiple proportions</u>.
- Linear Regression and Correlation Analysis – plus an exposure and Hands-On exercises of <u>Data Mining/Logistics Regression & Classification</u> concepts utilizing Excel Data Mining Add-Ins, SAS, or Minitab.

This course is the only required statistics course for business students. Hence, students do not have another opportunity to get exposed to these important topics should any of them be omitted. The instructor of this course is highly encouraged to plan for an effective and efficient coverage of all bulleted items above. In the event that he/she is unable to do so within the course of a semester, the <u>underlined</u> topics may be omitted.

VI. Methods of Instruction

Traditional: The preferred method of instruction for this course is lecture based. Depending on the individual instructors, opportunities for class discussion, group work, and student presentations may be considered. Students should be encouraged to form study groups and collaborate on the use of technology, understanding of lecture contents, and solution strategy and techniques to recommended exercises. Since business statistics is a quantitative subject in nature and requires certain level of analytical ability and mathematical skills, working through problems and exercises in a step-by-step manner would help students in better understanding of the subject than displaying the problem and its solution via PowerPoint presentation alone. Using a combination of lecture, slide presentations, and hands-on exercises is strongly recommended. Students should be encouraged to regularly participate in discussions and actively engage in practicing their critical thinking and quantitative skills through exercises and discussions.

Extend and Nature of Technology Use
The use of technology will depend on individual instructors. However, familiarity with Spreadsheet, MS Excel, is assumed and emphasized. Additionally, the use of technology should include BeachBoard, and the development of familiarity with web resources specific to the course. It may also include assignments that involve the evaluation of web materials on the subjects. Students may be made familiar, if they are not already, with relevant search databases in the library.

Required Texts
Since this course is offered in multiple sections, for conformity and consistency across all sections, it is highly recommended, but not mandated, that all sections of the course use a unified textbook designated by the course coordinator with consultation of the qualified department faculty and herein referred to as required textbook:

David R. Anderson, Dennis J. Sweeney, Thomas A. Williams, Jeffrey D. Camm. James J. Cochran, Statistics for Business and Economics, CENGAGE Learning Publishing, ISBN-10:1305585313, ISBN-13: 9781305585317 (Hardcover edition) or ISBN: 9781337694063 (CSULB customized paperback edition).

Instructors will be asked to justify the use of a different textbook, if different from the required text above, or utilizing an older text, if updated texts are available.

Selected Bibliography

1. Black, Ken, Business Statistics: Contemporary Decision Making, (2017) 9th Edition John Wiley, ISBN: 978-1-119-32089-0

2. Lind, Douglas A., Marchal, William G., and Wathen, Samuel A. (2018) Statistical Techniques in Business & Economics, 17th, or the Latest Edition, McGraw-Hill, ISBN: 1259666360

3. Doane, David P. and Seward, Lori E., Applied Statistics in Business and Economics (2015), 5th Edition, McGraw-Hill, ISBN-13: 978-0077837303; ISBN-10: 0077837304

4. Berenson, M. L., Krehbiel, T. C., and Levine, D. M. (2018). Basic business statistics: Concepts and applications, 12th Edition, Prentice Hall, ISBN-13: 978-0132168380; ISBN-10: 0132168383

5. Sharpe, Norean R., De Veaux, Richard D., and Velleman, Paul F. (2015), Business Statistics, 3rd Edition., Pearson, ISBN-10: 0133866912; ISBN-13: 9780133866919

6. Groebner, D. F., Shannon, P. W., Fry, P. C., and Smith, K. D. (2014). Business Statistics: A decision-making approach, 9th Edition. Pearson. ISBN-10: 0131545884, ISBN-13: 978-0133021844; ISBN-10: 013302184X

VII. Instructional Policies Requirements, Course Assessment and Grading

A. Assessment Criteria

Online Quizzes and Chapter Test Assessment
Students will complete many online self-assessed quizzes profiling of their competence on the text chapters using tools on various web sites, including one supplied by the textbook publisher.

At least three formal class tests
Each formal class test covers about four or possibly five chapters of the textbook. The tests must be carefully designed to measure learning goals described earlier. Each test must not count for more than one third of the course grade.

Grading Assignments
Traditionally, letter grades of A, B, C, D, and F are assigned to students with overall performance levels of above 90th, 80th, 70th, 60th, and below 60th percentiles, respectively. Instructor, at his/her discretion, may decide to normalize the grades. However, he/she must ensure that the overall class GPA is consistent with that of the department GPA for upper division courses and conforms to the course grand GPA (mean of means of IS 310 class GPA over the course of many semesters) Such data may be obtained from the course coordinator and department Administrative Support Coordinator (ASC).

Attendance, Participation Activities
Students are expected to attend all class meetings and complete all assignments to ensure passing the class with a grade of C or better. Instructor may include a reference to the current University

Policy on Attendance in the syllabus. All BeachBoard or independent site online activities, if any, must be completed by the posted deadlines, e.g. discussion boards, small group discussions, responses to instructor queries, etc.

B. Final Course Grade

In compliance with university policy: Final grades will be based on at least three, and preferably four or more, demonstrations of competence. In no case will the grade on any class tests should count for more than one-third of the course grade.

C. Attendance, Withdrawal, Late Assignments

Students are expected to have regular, punctual attendance. Students are requested to notify instructor when they will be absent. No late work is accepted, except by prior approval of instructor. Withdrawal policy is the same as that of the university posted policy.

VIII. Disabled Student Services Office (DSS)

The Disabled Student Services Office provides certification for students with disabilities and helps arrange relevant accommodations: Disabled Student Services. Any student requesting academic accommodations based on a disability is strongly encouraged to register with Disabled Student Services (DSS) each semester. A letter of verification for approved accommodations can be obtained from DSS. Please be sure to provide your instructor with DSS verification of accommodations as early in the semester as possible. The phone number for DSS is (562) 985 5401. The email address is: dss@csulb.edu.