# 7/21/2020

# brcc keystone logo

Baton Rouge Community College

*Academic Affairs Master Syllabus*

Date Approved: 2 September 2020

Term and Year of Implementation: Fall 2020

**Course Title:** Introduction to Statistical Analysis

**BRCC Course Rubric:** MATH 2084

**Previous Course Rubric**: MATH 208

**Lecture Hours per week-Lab Hours per week-Credit Hours**: 3-2-4

**Per semester: Lecture Hours-Lab Hours-Instructional Contact Hours**: 45-30-75

**Louisiana Common Course Number:**

**CIP Code:** 27.0501

**Course Description:** Descriptive statistics; inferential statistical methods including confidence interval estimation and hypothesis testing for one and two population means and proportions; one-way analysis of variance; simple linear regression and correlation; analysis of categorical data. Note that credit will not be awarded for both this course and for MATH 2303 (MATH 202) and MATH 2313 (MATH 203).

**Prerequisites:** Appropriate placement test score or MATH 1113 (or MATH 101) or MATH 1213 (or MATH 110) and CSCI 1013 (or CSCI 101) or CSCI 2203 (or CSCI 190) with a grade of C or better

**Co-requisites:** None

**Suggested Enrollment Cap:** 30

**Learning Outcomes.** *Upon successful completion of this course, the students will be able to:*

1. Sampling and Design of experiments.

2. Organize qualitative and quantitative data.

3. Summarize data using the measures of central tendency, such as median, mode, mean, and midrange.

4. Analyze and describe data using the measures of variation, such as the range, variance, and standard deviation.

5. Identify the position of a data value using various measures of position and use the five-number summary.

6. Use the properties of the normal distribution to find the area under the curve give various z scores, find probabilities for a normal distribution by transforming it into a standard normal distribution. Also find specific value for given percentages using the standard normal distribution.

7. Use the Central Limit Theorem to solve problems involving sample means for large and small samples.

8. Use the normal approximation to compute probabilities for a binomial variable.

9. Find the confidence intervals for z, t, and p.

10. Test the hypothesis for the z, t, and p.

11. Test the two-sample hypothesis for the z, t (paired t), and p.

12. Compute the least squares regression, coefficient of determination, the standard error of the estimate and correlation coefficient.

**General Education Learning Outcome(s):** This course supports the development of competency in the following area(s). Students will:

Represent mathematical information numerically, symbolically, and visually, using graphs and charts. (General Education Competency in Quantitative and Symbolic Reasoning)

**Assessment Measures.** Assessment of all learning outcomes will be measured using the following methods:

1. Instructor created exams and or homework

2. A comprehensive final exam

**Information to be included on the Instructor’s Course Syllabi:**

* ***Disability Statement*:** Baton Rouge Community College seeks to meet the needs of its students in many ways. See the Office of Disability Services to receive suggestions for disability statements that should be included in each syllabus.
* ***Grading:*** The College grading policy should be included in the course syllabus. Any special practices should also go here. This should include the instructor’s and/or the department’s policy for make-up work. For example in a speech course, “Speeches not given on due date will receive no grade higher than a sixty” or “Make-up work will not be accepted after the last day of class”.
* ***Attendance Policy*:** Include the overall attendance policy of the college. Instructors may want to add additional information in individual syllabi to meet the needs of their courses.
* ***General Policies*:** Instructors’ policy on the use of things such as beepers and cell phones and/or hand held programmable calculators should be covered in this section.
* ***Cheating and Plagiarism*:** This must be included in all syllabi and should include the penalties for incidents in a given class. Students should have a clear idea of what constitutes cheating in a given course.
* ***Safety Concerns:*** In some courses, this may be a major issue. For example, “No student will be allowed in the lab without safety glasses”. General statements such as, “Items that may be harmful to one’s self or others should not be brought to class”.
* ***Library/ Learning Resources:*** Since the development of the total person is part of our mission, assignments in the library and/or the Learning Resources Center should be included to assist students in enhancing skills and in using resources. Students should be encouraged to use the library for reading enjoyment as part of lifelong learning.

**Expanded Course Outline:**

I. Sampling and Experimental Design

II. Organizing Data

A. Quantitative Data

B. Qualitative Data

III. Measures of Central Tendency and Dispersion

A. Mean, Median, Mode

B. Variance and Standard Deviation

IV. Measures of Position and Five-Number Summary

A. Range

B. Percentile and Quartiles

V. The Normal Distribution

A. Properties of the Normal Distribution

B. Standard Normal Distribution

C. Normal Approximation of the Binomial Distribution

D. Applications of the Normal Distribution

E. The Central Limit Theorem

VI. Confidence Interval

A. Confidence Interval - z

B. Confidence Interval - t

C. Confidence Interval - p

V. Hypothesis Testing

A. Language of Hypothesis Testing

B. t- test and paired t-test

C. Simple ANOVA

D. Two-way ANOVA

E. ANOVA (three or more independent variables)

VI. Regression

A. Scatter Diagram and Correlation

B. Least-Squares Regression

C. Coefficient of Determination

D. Inference in Least-Squares Regression