CALIFORNIA STATE POLYTECHNIC UNIVERSITY, POMONA

ACADEMIC SENATE

GENERAL EDUCATION COMMITTEE

REPORT TO

THE ACADEMIC SENATE

GE-006-178

STA 1201 – Statistics with Applications Stretch I

General Education Committee   Date: 04/11/2018

Executive Committee
Received and Forwarded

                                                Date: 04/18/2018

Academic Senate

                                                Date: 05/02/2018
                                                        <u>First Reading</u>

BACKGROUND:

This is a new statistics course to be in accordance with the revised EO 1110 as it applies to GE Area B4. STA 1201 (and its activity STA 1201A which is included in this report) are prerequisites for STA 1202. STA 1201 and STA 1202 together are equivalent to STA 1200, and GE credit for sub area B4 is awarded upon completion of STA 1202. This path is designed to serve students with majors that require no college-level mathematics beyond introductory freshman-level statistics. STA 1201 (2 units) and STA 1201A (1 unit) together are not necessarily a GE course, but because the year-long sequence of 1201 and 1202 together satisfy Area B4, the GE Committee evaluated all these ECO's and found them to meet the requirements.

RESOURCES CONSULTED:

Faculty
Department Chairs
Associate Deans
Deans
Office of Academic Programs

DISCUSSION:

The GE Committee evaluated this course (STA1201 and its activity STA 1201A) considering the GE B4 Student Learning Outcomes (SLO's) and found it to satisfy the requirements of the first part of the year-long sequence (1201+1201A and 1202).

RECOMMENDATION:

The GE Committee recommends approval of GE-006-178, STA 1201 – Statistics with Applications Stretch I and its activity STA 1201A, and that when taken with STA 1202 – Statistics with Applications Stretch II fulfill GE Area B4 requirements.

Attachment 1 -
STA - 1201 - Statistics with Applications Stretch I
C. Course - New General Education* Updated

General Catalog Information

READ BEFORE YOU BEGIN

Import curriculum data from the Catalog by clicking on the following icon ⬇. It is a BEST PRACTICE to always import data on existing courses. This will limit the opportunity for data errors.

Turn the help text on by clicking on the following icon ⓘ.

All fields with an asterisk (*) are required fields. If left blank, the request will not be launched and cannot be acted upon.

Run and attach an impact report by clicking 📘 to show all courses and programs impacted by this proposal.

Attach additional documentation by clicking 🗇.

Department*	Mathematics and Statistics

Semester Subject Area*	STA	Semester Catalog Number*	1201
Quarter Subject Area		Quarter Catalog Number	

Course Title*	Statistics with Applications Stretch I

Units*	(2)

C/S Classification *	C-04 (Lecture/Recitation)

To view C/S Classification Long Description click: http://www.cpp.edu/~academic-programs/scheduling/Documents/Curriculum%20Guide/Appendix_C_CS_Classification.pdf

Component*	Lecture

Instruction Mode*	Face-to-Face

Grading Basis*	Graded Only

Repeat Basis*	May be taken only once

If it may be taken multiple times, limit on number of enrollments	1

Cross Listed Course Subject Area and Catalog Nbr (if offered with another department)	
Dual Listed Course Subject Area and Catalog number (If offered as lower/upper division or ugrd/grad)	
Choose appropriate type(s) of course(s) *	☐ Major Course ☑ Service Course ☐ GE Course ☐ None of the above
General Education Area / Subarea *	B4

To view the General Education SubArea definitions, click http://www.cpp.edu/~academic-programs/scheduling/Documents/Ch.3-GeneralEducationProposals.pdf.

I. Catalog Description

Catalog Description	This is the first semester of two in the Statistics with Applications stretch sequence that introduces the concepts of probability and basic descriptive statistics with requisite arithmetic and algebraic topics integrated throughout. This path is designed to serve students with majors that require no college-level mathematics beyond introductory freshman-level statistics. Students must take a year-long sequence to receive credit for college-level statistics. STA 1201 is a prerequisite for STA 1202. STA 1201 and STA 1202 together are equivalent to STA 1200, and GE credit is awarded upon completion of STA 1202. This sequence covers topics that include methods for basic definitions of statistics, collecting data, graphical and numerical descriptive statistics, correlation and simple linear regression. Algebra topics include linear equations in one and two variables, polynomials.

II. Required Coursework and Background

Prerequisite(s)

Corequisite(s)

STA 1201A

Pre or Corequisite(s)

Concurrent

III. Expected Outcomes

List the knowledge, skills, or abilities which students should possess upon completing the course. *

Students will be acquainted with the basic statistical concepts and data analysis techniques, and mathematical skills to support learning statistics.

Students should understand and be able to explain what statistics is, and be able to distinguish between descriptive and inferential statistics.

Students should be able to distinguish between populations and samples, and understand and explain methods and pitfalls of selecting samples from populations.

Students should be able to distinguish various types of variables and use appropriate descriptive statistics and graphics to summarize each type of variable

Students should be able to analyze bivariate data for linear patterns using simple linear regression and correlation;

Students should understand linear equations in one and two variables, and perform algebraic operations of polynomials.

If this is a course for the major, describe how these outcomes relate to the

mission, goals and objectives of the major program. Not a major course

Explain how the course meets the description of the GE SubArea(s). Please select appropriate outcomes according to the GE Area/SLO mapping.

The course description for subarea B4 is:

Courses in this area will require the student to use basic mathematical skills to develop mathematical reasoning, investigative and problem solving abilities, including applications from/to real life situations. Courses in this area will have an explicit intermediate algebra prerequisite, and students shall develop skills and understanding beyond the level of intermediate algebra. Students will not only practice computational skills, but will also be able to explain and apply basic mathematical concepts and solve problems using quantitative methods.

The Expected Outcomes for STA 1201 and STA 1202 together (note that GE credit is awarded only upon completion of the second course) include outcomes related to basic mathematical skills (SLOs 1, 3, 5) to develop mathematical reasoning (SLOs 2,4), investigative and problem solving abilities (SLOs 2, 3, 4), including applications from/to real life situations (SLOs 2, 3). The prerequisite is as described and the material goes well beyond the level of intermediate algebra. Students will be required to express their answers in complete sentences, without coherent explanations of the problem-solving and interpretations of the mathematics.

Describe how these outcomes relate to the associated GE Learning Outcomes listed below.＊

	Ia	Ie	IIa	IVb
O1	X		X	X
O2	X			X
O3	X	X		X
O4	X	X	X	X
O5	X	X	X	X

General Education Outcomes＊

Ia. Write effectively for various audiences

IIa. Apply scientific methods and models to draw quantitative and qualitative conclusions about the physical and natural world.

IVb. Demonstrate activities, techniques, or behaviors that promote intellectual or cultural growth.

Ie. Apply and communicate quantitative arguments using equations and graphical representations of data.

To view the mapping, click https://www.cpp.edu/~academic-programs/Documents/GE%20SLO%20Mapping.pdf

IV. <u>Instructional Materials</u>

Provide bibliography that includes texts that may be used as the primary source for instruction, and other appropriate reference materials to be used in instruction. The reference list should be current, arranged alphabetically by author and the materials should be listed in accepted bibliographic form.

Instructional Materials*	Texts may vary with instructor and over time. Examples of possible texts include: [Required] "*Understandable Statistics*," by Brase and Brase, 12th Edition, 2017, *Cengage Learnings*, ISBN: 978-0-470-44466-5. [Recommended] "*Beginning and Intermediate Algebra*," by Sherri Messersmith, Third Edition, *McGraw Hill*, ISBN: 978-0-07-729699-5.

Faculty are encouraged to make all materials accessible. Indicate with an asterisk those items that have had accessibility (ATI/Section 508) reviewed. For more information, http://www.cpp.edu/~accessibility

V. <u>Minimum Student Material</u>

List any materials, supplies, equipment, etc., which students must provide, such as notebooks, computers, internet access, special clothing or uniforms, safety equipment, lockers, sports equipment, etc. Note that materials that require the assessment of a fee may not be included unless the fee has been approved according to University procedures.

Minimum Student Material*	Paper, pen or pencil, internet access, computer or access to computer lab, calculators may be required by some instructors

VI. <u>Minimum College Facilities</u>

List the university facilities/equipment that will be required in order to offer this class, such as gymnastic equipment, special classroom, technological equipment, laboratories, etc.

Minimum College Facilities*	

Classroom with standard computer, classroom projection system, whiteboard or chalkboard, and screen.

VII. Course Outline

Describe specifically what will be included in the course content. This should not be a repetition of the course description but an expansion that provides information on specific material to be included in the class, e.g. lecture topics, skills to be taught, etc. This should not be a week-by-week guide unless all instructors are expected to follow that schedule.

Course Outline*   I. Introduction

What is statistics?
Distinguish populations and samples
Methods for selecting samples from populations

II. Descriptive Statistics

Data sets, observations, and variables
Types of variables (quantitative, qualitative, discrete, continuous, nominal, ordinal, ratio)
Frequency distributions, bar plots, and pie charts for qualitative data
Measures of location/central tendency, spread/dispersion, and position for quantitative data
Histogram, dot plots, bot plots for quantitative data

III. Reasoning about Bivariate Data

Scatterplots: forms and interpretations
Correlation: strength, positive, zero, negative
Simple linear regression: computations of slope and intercept, interpretations, prediction and extrapolation

IV. Linear Equations and Inequalities in One Variable

Overview of linear equations
Solving linear equations
Applications of linear equations
Solving linear inequalities

V. Linear Equations in Two Variables and Functions

Graphing by plotting points
Find intercept and slope of a line
Slope-intercept form and point-slope form of an equation
Introduction to functions

VI. Polynomials

Review of the rules of exponents

Addition, subtraction, multiplication, division of polynomials

Definition and evaluation of a polynomial function

VII. Functions and Their Graphs (*if time permits*)

Relations and functions

Graphs of functions and transformations

Quadratic functions and their graphs

Applications of quadratic functions

VIII. Instructional Methods

Describe the type(s) of method(s) that are required or recommended for the instruction of this course (lectures, demonstrations, etc.). Include any method that is essential to the course, such as the use of particular tools or software.

Instructional Methods*	Lecture, class discussion, and class activities (small group or individual) of topics. Hands-on use of the computer and class discussion of computer outputs.

IX. Evaluation of Outcomes

Describe the methods to be used to evaluate students' learning, i.e. written exams, term papers, projects, participation, quizzes, attendance, etc.*	Students will be evaluated on the basis of their performance on Assigned homework Class activities Quizzes, midterm exams, and final examination. Students are required to present their solutions to problems in a clear and coherent form. Complete sentences are required whether they be verbal or symbolic, and these sentences must be organized in such a fashion as to give a clear exposition of the problem.
Describe the meaningful writing assignments to be included.*	This course contains multiple assessments with a written component. Clear writing is important in mathematics, as it is in any other field. Students are required to present their solutions in a clear and coherent form. Complete sentences are required, whether they be verbal or symbolic, and these sentences must be organized in such a fashion as to give a clear exposition of the problem. Feedback will be given throughout the quarter by the instructor.
Discuss how these methods may be used to address the course and	

program outcomes, as appropriate. Include or attach a matrix to align the evaluation methods to the outcomes. *

All methods will be used to evaluate all outcomes, with the expection of Outcome 1, which will be assessed primarily by Methods 1 and 3.

If this is a general education course, discuss how these methods may be used to address the associated GE Learning Outcomes listed below. Include or attach a matrix to align the evaluation methods to the outcomes. *

The matrix shows the alignment of evaluation methods to the GE Outcomes listed above.

	Homework	Activities	Quizzes, Exams
Ia	X	X	
Ie	X	X	X
IIa	X	X	X
IVb	X		X

X. This OPTIONAL Section is for describing Course/Department/College specific requirements.

Attachment 2 – STA 1201A

Department: Mathematics & Statistics

Subject Area: STA

Catalog Number: 1201A

Course Title: Introduction to Statistics Activity

Units: (1)

C/S Classification: C-07 (Activity)

Graduate Course? No

Component: Activity

Instruction mode: Face-to-face

Grading basis: Graded only

Repeat Basis: May be taken only once

Catalog Description: An activity class associated with STA 1201, Statistics with Applications Stretch I. Hands-on activities and projects to understand and apply the concepts of statistics.

Corequisite: STA 1201

List the knowledge, skills, or abilities which students should possess upon completing the course:

1. Students will apply statistical models to real-world problems.

2. Students will learn skills in computing statistical quantities.

3. Students will practice and strengthen skills in intermediate algebra.

Instructional Materials:

Materials used for STA 1201.

Required: "Understandable Statistics," by Brase and Brase, 12th Edition, 2017, Cengage Learnings, ISBN: 978-0-470-44466-5.

Recommended: "Beginning and Intermediate Algebra," by Sherri Messersmith, Third Edition, McGraw Hill, ISBN: 978-0-07-729699-5.

Minimum Student Material:

Paper, pen or pencil, internet access, computer or access to computer lab, calculators may be required by some instructors

Minimum college facilities:

Classroom with standard computer, classroom projection system, whiteboard or chalkboard, and screen, Math & Stats emporium computer lab.

Instructional Methods:

Classroom discussion, activity, computer-aided demonstration. Use of software including online homework systems, spreadsheets.

Methods of evaluation:

Online homework

Quizzes

In-class activities or participation

Meaningful Writing Assignments:

This course contains multiple assessments with a written component. Clear writing is important in mathematics, as it is in any other field. Students are required to present their solutions in a clear and coherent form. Complete sentences are required, whether they be verbal or symbolic, and these sentences must be organized in such a fashion as to give a clear exposition of the problem. Feedback will be given throughout the quarter by the instructor.

Alignment of methods of evaluation with student outcomes:

The matrix summarizes which outcomes will be primarily measured by each method of evaluation.

	Activities	Quizzes	Homework
01	X		
02	X	X	X
03		X	X