All Fields Report

Basic Course Information	
College	Cañada College
Discipline	MATH-Mathematics
Course Number	190
Full Course Title	Path to Statistics
Catalog Course Description	This accelerated course prepares students for transfer-level Statistics. It covers core concepts from elementary algebra, intermediate algebra, and descriptive statistics. Topics include ratios, rates, and proportional reasoning; arithmetic reasoning using fractions, decimals and percents; evaluating expressions, solving equations, analyzing algebraic forms to understand statistical measures; use of linear, quadratic, absolute value, exponential, and logarithmic functions to model bivariate data; graphical and numerical descriptive statistics for quantitative and categorical data. This course is designed for students who do not want to major in fields such as math, science, computer science, or business.
Proposal Information	
Proposed Start	Year: 2023 Semester: Fall
Proposed Curriculum Committee Meeting Date:	11/18/2022
Deadline for submission to Dean's Queue:	10/13/2022
Deadline for submission of curriculum proposal to the Technical Review Committee:	10/25/2022
Proposal Origination Date:	10/14/2022
Justification For Board Report OR Curriculum Inventory update:	1. For NEW Courses: Provide a brief justification statement describing the need for the course, its place in the curriculum, and pertinent information such as the role of advisory committees. New courses require approval of the SMCCCD Board of Trustees. The justification statement will be included on the annual Curricular Board report. Use complete sentences and present tense. 2. For all types of Course MODIFICATIONS (modifications, banking, deletions and reactivations): Provide a brief justification statement describing the need for the change. The justification statement will be used for course updates in the State Curriculum Inventory as necessary. Use complete sentences and present tense. Banking pre-transfer Math courses pursuant to AB 705
Honors Course	No
Open Entry/Open Exit	No 0

Equivalent Courses	
Will this course replace an existing course in the catalog, or an experimental course?	No
If yes, identify and explain.	

Similar Courses

Is there a similar or equivalent course in SMCCCD?	Yes
Added Similar Courses	MATH 190 (College of San Mateo) MATH 190 (Skyline College)

Units/Hours

Unit Types	Fixed
Units	Min: 6.00
Variable Range	Range (or)

Hours

Please enter hours as per term values

Method	Min Hours	Max Hours	Min Faculty Load	Min Units
Lecture	96.00	108.00	6.00	6.00
Lab	0.00	0.00	0.00	0.00
TBA	0.00	0.00	0.00	0.00
Work Experience	0.00	0.00	0.00	0.00
Field Experience	0.00	0.00	0.00	0.00
Other	0.00	0.00	0.00	0.00
Homework	192.00	216.00	0.00	0.00
Total Student Learning	288.00	324.00	6.00	6.00

Other Hours	

Course Details

Repeatable for Credit	No
Grading Methods	Letter Grade Only
Audit	Yes

Materials Fee

Fee Required?	No

Student Learning Outcomes

Upon successful completion of this course, a student will meet the following outcomes:

1. Use technology to analyze data by producing appropriate descriptive statistics and plots.
2. Create and manipulate relevant algebraic models in one and two variables
3. Interpret the meanings of relevant summary statistics and plots in authentic contexts.

Course Objectives

Upon successful completion of this course, a student will be able to:

Think Statistically

1. Become familiar with and use appropriate exploratory data analysis techniques
2. Determine if variables are quantitative or categorical and use appropriate graphs and methods to analyze.

3. Analyze patterns in data including sequences.
4. Learn mathematical notation such as summation, statistical symbols.
5. Use estimation effectively to find and discover feasible solutions and errors.
6. Analyze and interpret numerical values including scientific notation.
7. Construct and analyze graphs including bar graphs, pie charts, histograms, stem and leaf plots, boxplots, and scatterplots.
8. Be able to effectively discuss trends in data and applied problems both verbally and in written form (Rule of Four).
9. Analyze design of experiments principles in published articles, surveys, or case studies. Test published claims by collecting and analyzing data.
10. Learn measures of central tendency and measures of dispersion and when to use them appropriately.
11. Be able to effectively discuss trends in data and applied problems both verbally and in written form (Rule of Four).
12. Introduce counting techniques (Binomial expansion and Pascal's Triangle) and basic probability.
Model Algebraically
1. Solve linear equations and inequalities in one variable.
2. Use linear equations to solve various application problems.
3. Find the slope and equation of a line in two variables and graph.
4. Work with data to perform basic regression analysis.
5. Use dimensional analysis to perform unit conversions.
6. Solve problems involving ratios, proportions, and percents.
7. Use various algebraic concepts such as absolute value and the Pythagorean theorem.
8. Evaluate and solve various models such as linear, exponential, quadratic, logarithmic, and radical using the Rule of Four.
9. Analyze relationships between variables including direct and inverse variation.
Learn Effectively
1. Attend class regularly and be punctual in turning in assignments.
2. Work productively with peers on group assignments.
3. Seek help from peers, instructor, and other resources when necessary.

Course Lecture Content

A. CATEGORICAL VARIABLES:

- Graphs of distributions of categorical data: bar charts and pie charts
    1. Constructing and reading bar charts and pie charts;
    2. Using fractions, decimals and percents to interpret bar charts and pie charts;
    3. Recognizing and generating equivalent forms of fractions, decimals, and percents;
    4. Comparing fractions with the same denominator;
    5. Comparing fractions, decimals, and percents.
    6. Contingency tables: marginal and conditional distributions
        - Comparing fractions with different denominators;
        - Comparing fractions, decimals, percents;
        - Identifying fractions and percents that describe part of a whole (marginal distributions);
        - Identifying fractions and percents that describe the impact of one quantity on another (conditional distributions).

B. QUANTITATIVE VARIABLES:

- Measures of center and associated measures of spread: mean, variance, standard deviation; median, quartiles, percentiles
    1. Computing with and interpreting fractions, decimals, percents, signed numbers as they relate to these formulas and concepts;
    2. Evaluating expressions using the order of operations;
    3. Solving equations;
    4. Analyzing algebraic structures and forms to understand these measures.
    5. Analyzing algebraic structures geometrically. Geometric interpretations relate to why standard deviation is roughly an average distance from the mean and why positively associated data in a scatterplot gives positive correlation.
    6. Graphs of univariate distributions of quantitative data: histograms, stem-and-leaf plots, boxplots,
        - Graphing fractions, decimals, and signed numbers on a number line;
        - Evaluating expressions
        - Relative vs. absolute difference
    7. Graphs and models for bivariate distributions of quantitative variables, including interpreting scatterplots using linear and logarithmic scales, use of least-squares regression, calculation and interpretation of correlation coefficient (r) and as measures of strength and spread in linear regression.
        - A graph as the set of solutions to an equation;
        - Graphing in the Cartesian coordinate system;
        - Scatterplots;
        - Functions;
        - Linear functions, constant rate of change, graphing, interpreting slope and y-intercept in context;
        - Solving equations;
        - Proportions and linearity;
        - Exponential functions, constant % change, graphing, interpreting initial value and growth or decay rates;
        - Logarithmic scales.

C. DATA PRODUCTION:

- Sample and sample statistic vs. population and population parameter
- Observation vs. experiment
- Principles of responsible survey and experiment design
- Purpose of randomization vs purpose of random sampling
- Simple random samples and other sampling designs
- Randomized comparative experiments, matched pairs and block designs
- Cautions about sample surveys and experimentation

D. PROBABILITY

- Introduction to Probability
- Probability Rules
- Probability Distributions for Random Variables

E. TOPICS RELATED TO DEVELOPING EFFECTIVE LEARNING SKILLS

- Study skills: for example, organization and time management, test preparation and test-taking skills
- Self-assessment: for example, using performance criteria to judge and improve one’s own work, analyzing and correcting errors on one’s test

- Use of resources: for example, strategies for identifying, utilizing, and evaluating the effectiveness of resources in improving one's own learning, e.g. peer study groups, computer resources, lab services

Course Lab Content

TBA Hours Content

Frequently Recommended Preparation

Frequently Recommended	

Justification for Frequently Recommended Preparation

Why is the knowledge of the recommended course(s), skill(s) or information necessary for students to succeed in the "target" course? Specify the relationship between the recommended knowledge and skills required of students and those taught in the "target course? (Please list the specific proficiencies students must possess in order to succeed in the "target" course.)

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Other Recommended Preparation

You have no defined requisites.

Prerequisites/Corequisites

Drag and Drop to Reorder

Edit/Delete	Requisites	Analysis
	Prerequisite MATH 811 or appropriate score on the College Placement Test or other multiple measures assessment.	

Content Review

MATH 811 - Prerequisite
(Objective to Objective)
Historical

Mode of Delivery

Modes of Delivery
Online
Hybrid
Lecture

Representative Instructional Methods

Methods	Lecture

	Discussion Individualized Instruction
Other Methods	

Representative Assignments

Writing Assignments
(List all assignments, including library assignments. Outside assignments are not required for lab-only courses, although they can be given.)

Approximately 1 writing project two weeks as follows:

Given a data set use technology to generate relevant descriptive statistics and create relevant plots, graphs or charts and write a 1-2 page essay explaining how the data supports the thesis. Grading will be based on how well you are able to incorporate descriptive statistics into a coherent argument supporting a thesis.

Reading Assignments
(List all assignments, including library assignments. Outside assignments are not required for lab-only courses, although they can be given.)

- Textbook sections: at least 1 every week, approximately 5 pages per section.
- Articles exemplifying practical applications of descriptive statistics: once per instructional unit, approximately 10 pages each.
- Articles on learning theory, affective domain, or other topics related to student success. At least 3 per semester, approximately 5 pages each.

Other Outside Assignments
(List all assignments, including library assignments. Outside assignments are not required for lab-only courses, although they can be given.)

Other assginments may include:

- Group projects: eg. Collecting, analyzing, and presenting data.

To be Arranged Assignments
(List all assignments, including library assignments. Outside assignments are not required for lab-only courses, although they can be given.)

- Not applicable.

Representative Methods of Evaluation

This section defines the ways students will demonstrate that they have met the student learning outcomes.

Student grades will be based on multiple measures of student performance. Instructors will develop appropriate classroom assessment methods and procedures for calculating student grades, including the final semester grade. The following list displays typical assessment methods appropriate for this course. The actual assessment methods used in a particular classroom and section will be listed in the instructor?s syllabus.

Methods must effectively evaluate critical thinking. Credit courses must include written communication, problem solving, and/or skills demonstrations.

Multiple measures may include, but are not limited to, the following:

Methods	• Class Participation • Class Performance • Class Work • Exams/Tests • Group Projects • Homework • Oral Presentation • Papers • Portfolios • Projects • Quizzes • Research Projects

Representative Texts

Textbooks such as the following are appropriate:

Formatting Style	APA

Textbooks

	1. Lehmann, J.. *A Pathway to Introductory Statistics*, 2 ed. Pearson, 2021
	2. Bennet, Briggs, Triola. *Statistical Reasoning for Everyday Life.*, 5 ed. Pearson, 2018

Manuals

You have no manuals defined.

Periodicals

You have no periodicals defined.

Software

You have no software defined.
Other
You have no other defined.

Degree/Certificate Applicability	
Designation	Degree Credit
Proposed For	
Course Designation Text	Are there degrees/certificates to which this course applies? None.

General Education/Degree/Transfer Course	
Page Last Saved on Friday, Oct 14, 2022 at 1:58 PM By Jose Pena	
CSU Transfer Course	
	Does not transfer to CSU Approved
Cañada: BASIC COMPETENCY REQUIREMENTS	
	Math Approved

Course Distance Education	
Distance Ed Supplement	New distance education supplement
Distance Education	Distance education component was developed by an instructor with training in online pedagogy. Training: This course was designed in consultation with, and will be taught by, faculty who have received STOTs, @One, Cañada's QOLT (Quality OnLine Training), Cañada's QOTL (Quality Online Teaching & Learning) or equivalent certifications
Method of Distance Education	Online, Hybrid, Web Assisted Course; (If there are limitations on how this course would be offered please explain below)
Online Method Limitations	
Other Methods	
Course Content and Methodology	The objectives and content of the course are adequately covered by the methods of instruction, assignments, evaluation of student outcomes, and instructional materials. If this course is currently taught in a lecture mode, the department faculty have determined that the same objectives can be achieved in a distance learning mode. The instructional equipment and materials are sufficient. The preparation and training of faculty are sufficient. Regular personal contact between students and instructor is sufficient. Methods of student evaluation are designed to maintain examination security. Evaluation of student outcomes is sufficient to permit review and assessment of the effectiveness of distance education for this course and to provide information for the annual distance education report.
Instructional Methodologies (How will	Announcements/Bulletin Boards E-mail Electronic Forum

you deliver the course content?):	Online Presentations Resource Links Two-Way Video conferencing (Two-way interactive video and audio)
Representative Courseware/Textbooks Materials:	Possible textbooks include: Math 190 Activity Packet, developed with coordination of faculty at Los Medanos College. Open Learning Initiative (Carnegie Mellon University), Concepts of Statistics, https://oli.cmu.edu
Methods of Evaluation of Student Performance:	Online Quizzes (about 2/month) Online Midterm Exams (about 3/term) Online Homework (about 1/week)
How are you ensuring that students with disabilities can access your course in accordance with Section 508?	1. Videos are captioned 2. Lecture screen-casts are captioned 3. Transcripts are provided for all multi-media files (audio and visual) 4. Alt-text is used for embedded images 5. Standardized formatting is used to support screen readers 6. All files are assessed with Accessibility Check options in Microsoft Office 7. Course is evaluated using the OEI Rubric (Online Education Initiative) 8. Faculty will work with DRC to ensure that proper accommodations are provided for students (e.g., extended time, Kurzweil, other UDI supports)

Plan for Regular Effective Communication Contact Between Faculty and Student (Title 5, 55204). "Local policies should establish and monitor minimum standards of regular effective contact."

Announcements/Bulletin Boards - Instructor will make regular announcements using campus LMS.
Discussion Boards - There will be regular online discussion boards using LMS where students will be able to answer and ask questions about the units homework. Instructor will monitor and respond where appropriate every 24-48 hours.
Email Communication - Instructor will respond to email correspondence within 24-48 hours.
Other (explain) - Regular 2-way conference meetings where students complete group activities.

Resources Needed

Adequate Library Resources	Consultation with the Coordinator of Library Services regarding the adequacy of campus and online information resources to fulfill course objectives is required prior to course approval. Inadequate to support the course Please Specify:
Affected Resources	Which of the following resources do you expect to be affected by the offering of this class? Check as many as appropriate. --- Microcomputer Lab New equipment needs

Explain what effect the areas you have checked will have upon this college:

Need computer lab and software.

Comparable Transfer Course Information

Are there comparable courses?	No

Minimum Qualification

No Minimum Qualifications For this Course

CB Codes

CB03 TOP Code	1701.00 - Mathematics, General
CB04 Course Credit Status	D - Credit - Degree Applicable
CB05 Course Transfer Status	C = Not Transferable
CB08 Course Basic Skill Status (PBS Status)	2N = Course is not a basic skills course.
CB09 SAM Code	E - Non-Occupational
CB11 California Classification Codes	Y - Credit Course
CB21 Levels Below Transfer	A = 1 Level Below
CB23 Funding Agency Category	Y = Not Applicable
CB25 Course General Education Status	Y - Not Applicable
CB26 Course Support Course Status	N - Course is not a support course

Web Catalog Metadata