Glendale College
Course Outline of Record Report

Course ID 003260

Revision - May 2023

MATH136 : Statistics

General Information

Author:	• Suzanne Palermo
Course Code (CB01) :	MATH136
Course Title (CB02) :	Statistics
Department:	MATH
Proposal Start:	Fall 2023
TOP Code (CB03) :	(1701.00) Mathematics, General
CIP Code:	(27.0101) Mathematics, General.
SAM Code (CB09) :	Non-Occupational
Distance Education Approved:	Yes
Will this course be taught asynchronously?:	No
Course Control Number (CB00) :	CCC000157746
Curriculum Committee Approval Date:	05/10/2023
Board of Trustees Approval Date:	06/20/2023
Last Cyclical Review Date:	04/01/2020
Course Description and Course Note:	MATH 136 is a one-semester course designed for students whose major requires a course in statistics. Topics in this course include: the nature of statistical methods, types of data, introductory probability, sampling theory, experimental design, confidence intervals, hypothesis testing, regression analysis, and decision making. Emphasis will be placed on the application of statistical concepts to real world data, development of statistical reasoning, and the interpretation of results.
Justification:	Coding/Category Change
Academic Career:	• Credit
Author:	• Suzanne Palermo

Academic Senate Discipline

Primary Discipline:	• Mathematics
Alternate Discipline:	No value
Alternate Discipline:	No value

Transferability & Gen. Ed. Options

General Education Status (CB25)

GE Status (CSU) B4, (UC) 2

Transferability

Transferable to both UC and CSU

Transferability Status

Approved

IGETC Area	Area	Status	Approval Date	Comparable Course
2-Math	Mathematical Concepts and Quantitative Reasoning	Approved	08/22/1994	No Comparable Course defined.

CSU GE-Breadth Area	Area	Status	Approval Date	Comparable Course
B4-Mathematics/Quantitative Reasoning	Mathematics/Quantitative Reasoning	Approved	08/24/1993	No Comparable Course defined.

C-ID	Area	Status	Approval Date	Comparable Course
MATH	Mathematics	Approved	08/31/2015	MATH 110 - Introduction to Statistics

Units and Hours

Summary

Minimum Credit Units (CB07)	4
Maximum Credit Units (CB06)	4
Total Course In-Class (Contact) Hours	72
Total Course Out-of-Class Hours	144
Total Student Learning Hours	216

Credit / Non-Credit Options

Course Type (CB04)

Credit - Degree Applicable

Noncredit Course Category (CB22)

Credit Course.

Noncredit Special Characteristics

No Value

Course Classification Code (CB11)

Credit Course.

☐ Variable Credit Course

Funding Agency Category (CB23)

Not Applicable.

☐ Cooperative Work Experience Education Status (CB10)

Weekly Student Hours

	In Class	Out of Class
Lecture Hours	4	8
Laboratory Hours	0	0

Course Student Hours

Course Duration (Weeks)	18
Hours per unit divisor	54
Course In-Class (Contact) Hours	

Studio Hours	0	0	Lecture	72
			Laboratory	0
			Studio	0
			Total	72

Course Out-of-Class Hours

Lecture	144
Laboratory	0
Studio	0
Total	144

Time Commitment Notes for Students

No value

Pre-requisites, Co-requisites, Anti-requisites and Advisories

Prerequisite

Placement is based on academic background or satisfactory completion of MATH 90

OR

Prerequisite

MATH90 - Intermediate Algebra for BSTEM (in-development)

<u>Objectives</u>
- Solve absolute value equations and inequalities;
- solve linear equations and compound inequalities;
- perform operations with polynomials;
- simplify complex fractions;
- perform operations with radical expressions;
- simplify expressions with rational exponents;
- solve rational equations;
- solve equations with radicals;
- find the equation of a line parallel or perpendicular to a given line;
- solve a system of linear equations using elimination substitution;
- solve systems of linear inequalities;
- find the composition of two functions;
- solve applied problems;
- solve quadratic equations with real and complex solutions;
- find the inverse of a function;
- use the properties of logarithms to simplify and expand expressions;
- solve logarithmic and exponential equations;
- graph parabolas and circles centered at any point.
- graph functions (linear, quadratic, exponential, logarithmic);

AND

Advisory

ENGL101 - Introduction to College Reading and Composition

<u>Objectives</u>

- Read, analyze, and evaluate a variety of primarily non-fiction readings for content, context, and rhetorical merit with consideration of tone, audience, and purpose;
- integrate the ideas of others through paraphrasing, summarizing, and quoting without plagiarism;
- find, evaluate, analyze, and interpret primary and secondary sources, incorporating them into written essays using appropriate documentation format;

Entry Standards

Entry Standards

No value

Specifications

Methods of Instruction

Methods of Instruction	Lecture

Methods of Instruction	Discussion

Methods of Instruction	Demonstrations

Out of Class Assignments

- Homework (e.g. problems sets related to course content)
- Projects involving analysis of real-world data using statistical software (e.g. collect data and create a written report including graphical displays and numeric summaries.)

Methods of Evaluation	**Rationale**
Exam/Quiz/Test	Four to five chapter exams
Exam/Quiz/Test	A comprehensive final examination to test problem solving

Textbook Rationale

No Value

Textbooks

Author	Title	Publisher	Date	ISBN

| Sullivan, Michael | Statistics: Informed Decision Using Data | Pearson | 2020 | 9780136872740 |
| Illowsky, Barbara Dean, Susan | Introductory Statistics | OpenStax | 2022 | 978-1-947172-05-0 |

Other Instructional Materials (i.e. OER, handouts)

No Value

Learning Outcomes and Objectives

Course Objectives

Describe and analyze realistic data sets both large and small from disciplines including business, social science, psychology, life science, health science and education using graphs and statistics

Analyze real world results, interpret the output of a technology-based statistical analysis and identify flaws in statistical reasoning

Identify the standard methods of obtaining data and identify advantages and disadvantages of each

Calculate probability using the normal distribution, the t distribution and the basic laws of probability

Describe sampling distributions, distinguish them from population distributions and analyze the role played by the Central Limit Theorem

Compute confidence intervals of population means, proportions and standard deviations

Identify the basic concept of hypothesis testing including Type I and II errors, finding and interpreting levels of significance including p-values, selecting the appropriate techniques for testing a hypothesis from one and two populations and interpreting the result

Perform chi-square tests using chi-square tables and statistical software or calculator

Use linear regression and ANOVA analysis for estimation and inference, and interpret the statistics

Calculate and present results using sound statistical reasoning, accurate statistical terminology and technology such as spreadsheets, graphing calculators or StatCrunch

SLOs

Analyze and describe studies, data sets, and probability models.

Expected Outcome Performance: 70.0

SOC Sociology - AA-T	Critically analyze and evaluate social phenomena, which involve social institutions and processes, within various contexts from the local to the global.
ILOs General Education	apply techniques of analysis and critical thinking to critique real world and theoretical topics and issues
ECON Economics - AA-T	critically analyze and evaluate economic decision-making and economic policies.
BIOL Biology AS-T	well-qualified as transfer students to a four-year university biology program.

Apply confidence intervals and hypothesis testing to form conclusions about realistic data.

Expected Outcome Performance: 70.0

ILOs General Education	apply techniques of analysis and critical thinking to critique real world and theoretical topics and issues
BIOL Biology AS-T	well-qualified as transfer students to a four-year university biology program.

Additional SLO Information

Does this proposal include revisions that might improve student attainment of course learning outcomes?

No Value

Is this proposal submitted in response to learning outcomes assessment data?

No Value

If yes was selected in either of the above questions for learning outcomes, explain and attach evidence of discussions about learning outcomes.

No Value

SLO Evidence

No Value

Course Content

Lecture Content

Descriptive Statistics (24)
- Graphical descriptions of data
- Measures of center: mean, median, and mode
- Measures of spread; standard deviation/variance, quartiles, and range
- Density curves, including normal distributions
- Linear regression, including residual analysis
- Correlation

- 2-Way Tables
- Data set analysis using statistical software and or statistical calculators
- Identification of confounding and lurking variables and other possible misinterpretations of statistical conclusions

Producing Data (5)
- Design of sampling procedures
- Design of experiments
- Strengths and limitations of experimental designs

Probability and Sampling Distributions (11)
- Probability models
- Computing probabilities using the addition and multiplication rules
- Expected value
- The Central Limit Theorem
- Binomial distributions

Inferences Using Sample Means, Proportions, and Standard Deviations (32)
- Confidence intervals for the population proportion and mean
- One and two-sample hypothesis tests of population proportions and means; Z-test and Student's t-test
- Type I and Type II errors
- Chi-square distribution
- Linear regression and ANOVA analysis for estimation and inference
- Accurate presentation of inferential conclusions

Total Hours=72