MATH 15 Course Outline as of Summer 2019

CATALOG INFORMATION

Dept and Nbr: MATH 15   Title: ELEMENTARY STATISTICS
Full Title: Elementary Statistics
Last Reviewed: 1/9/2024

Units		Course Hours per Week		Nbr of Weeks	Course Hours Total	
Maximum	4.00	Lecture Scheduled	4.00	17.5	Lecture Scheduled	70.00
Minimum	4.00	Lab Scheduled	0	6	Lab Scheduled	0
		Contact DHR	0		Contact DHR	0
		Contact Total	4.00		Contact Total	70.00
		Non-contact DHR	0		Non-contact DHR	0

Total Out of Class Hours: 140.00   Total Student Learning Hours: 210.00

Title 5 Category: AA Degree Applicable
Grading: Grade or P/NP
Repeatability: 00 - Two Repeats if Grade was D, F, NC, or NP
Also Listed As:
Formerly:

Catalog Description:
Exploration of concepts in statistics, descriptive statistics, probability theory, Central Limit Theorem, estimation of population parameters from a sample, hypothesis testing, correlation and linear regression, introduction to analysis of variance, and computer simulations.

Prerequisites/Corequisites:
Completion of MATH 161 OR MATH 156 OR MATH 154 OR MATH 155 or AB705 placement into Math Tier 1 or higher

Recommended Preparation:

Limits on Enrollment:

Schedule of Classes Information:
Description: Exploration of concepts in statistics, descriptive statistics, probability theory, Central Limit Theorem, estimation of population parameters from a sample, hypothesis testing, correlation and linear regression, introduction to analysis of variance, and computer simulations. (Grade or P/NP)

Prerequisites/Corequisites: Completion of MATH 161 OR MATH 156 OR MATH 154 OR MATH 155 or AB705 placement into Math Tier 1 or higher
Recommended:
Limits on Enrollment:
Transfer Credit: CSU;UC.
Repeatability: Two Repeats if Grade was D, F, NC, or NP

ARTICULATION, MAJOR, and CERTIFICATION INFORMATION:

AS Degree:	**Area**		Effective:	Inactive:
	B	Communication and Analytical Thinking	Fall 1989	
	MC	Math Competency	Fall 1981	
CSU GE:	**Transfer Area**		Effective:	Inactive:
	B4	Math/Quantitative Reasoning	Fall 1990	

IGETC:	**Transfer Area**		Effective:	Inactive:
	2A	Mathematical Concepts & Quantitative Reasoning	Fall 1993	

CSU Transfer:	Transferable	Effective:	Fall 1989	Inactive:

UC Transfer:	Transferable	Effective:	Fall 1989	Inactive:

CID:

CID Descriptor:	MATH 110	Introduction to Statistics
SRJC Equivalent Course(s):		MATH15 OR PSYC9

Certificate/Major Applicable:
Both Certificate and Major Applicable

Approval and Dates

Version:	010	Course Created/Approved:	10/31/1989
Version Created:	9/20/2018	Course Last Modified:	12/30/2023
Submitter:	Ivana Gorgievska	Course last full review:	1/9/2024
Version Status:	Approved (Changed Course)	Prereq Created/Approved:	1/9/2024
Version Status Date:	10/22/2018	Semester Last Taught:	Fall 2023
Version Term Effective:	Summer 2019	Term Inactive:	Fall 2024

COURSE CONTENT

Student Learning Outcomes:
At the conclusion of this course, the student should be able to:
1. Use numerical and graphical methods to summarize, display, and interpret data sets.
2. Estimate population parameters from sample statistics.
3. Perform one and two sample hypothesis tests for population means and proportions.

Objectives:
At the conclusion of this course, the student should be able to:

1. Create and use graphic displays of data and frequency distributions.
2. Identify the standard methods of obtaining data and identify advantages and disadvantages of each method.
3. Distinguish among different scales of measurement and their implications.
4. Define mean, median, mode, percentiles, variability and standard deviation, and compute each for sets of data.
5. Use laws of probability.
6. Apply concepts of sample space and probability distributions, including calculation of the mean and variance of a discrete distribution, and calculation of probabilities using normal and t distributions.
7. Distinguish between sample and population distributions, and apply the Central Limit Theorem to calculate sampling distributions of means, proportions and standard error.
8. Compute and interpret confidence intervals and required sample size.
9. Identify the basic concept of hypothesis testing including Type I and II errors.
10. Select the appropriate technique for testing a hypothesis and interpret the result.
11. Perform hypothesis testing for mean, proportion and variance.
12. Determine and interpret levels of statistical significance including p-values.
13. Implement goodness of fit test, and the test for independence.
14. Use linear regression and Analysis of Variance (ANOVA) for estimation and inference, and interpret the associated statistics.
15. Use statistical software for evaluation of data and inference.
16. Process data sets from disciplines including business, social sciences, psychology, life sciences, health sciences and education.

Topics and Scope:

I. Statistical Description
    A. Graphic display of univariate and bivariate data
    B. Levels of measurement
    C. Frequency distributions
        1. Shapes of distributions
        2. Empirical rule
    D. Measures of central tendency
    E. Measures of variation
    F. Measures of relative position
    G. Correlation
II. Probability Theory
    A. Sample space and laws of probability
    B. Random variables and expected value
    C. Probability distributions including, but not limited to
        1. Binomial
        2. Normal
        3. Student
        4. Chi squared
III. Statistical Inference
    A. Sampling methods and experimental design
    B. Sampling distributions of means and proportions
    C. Standard error
    D. Central Limit Theorem
    E. Estimation and confidence intervals
    F. Hypothesis testing
        1. Tests of proportions and means, including t-tests for one and two populations

2. Chi square tests: goodness of fit and independence
3. P-values, significance, type I and type II errors
G. Required sample size
H. Correlation and linear regression
I. Introduction to ANOVA (analysis of variance)
IV. Use of Statistical Software
   A. Analysis and evaluation of data
   B. Methods of simulations
V. Use Data Sets from Disciplines, such as:
   A. Business
   B. Social sciences
   C. Behavioral sciences
   D. Life sciences
   E. Health sciences
   F. Education

Assignment:

1. Reading outside of class (0-50 pages per week)
2. Problem set assignments from required text(s) or supplementary materials chosen by the instructor (8-16)
3. Exams (2-4) and a final exam; quizzes (0-20)
4. Projects, e.g. computer activities, surveys or data collection and analysis (0-2)

Methods of Evaluation/Basis of Grade:

Writing: Assessment tools that demonstrate writing skills and/or require students to select, organize and explain ideas in writing.

None, This is a degree applicable course but assessment tools based on writing are not included because problem solving assessments are more appropriate for this course.	Writing 0 - 0%

Problem Solving: Assessment tools, other than exams, that demonstrate competence in computational or non-computational problem solving skills.

Problem sets	Problem solving 10 - 30%

Skill Demonstrations: All skill-based and physical demonstrations used for assessment purposes including skill performance exams.

None	Skill Demonstrations 0 - 0%

Exams: All forms of formal testing, other than skill performance exams.

Objective exams, quizzes, final	Exams 70 - 80%

Other: Includes any assessment tools that do not logically fit into the above categories.

Projects

Other Category
0 - 10%

Representative Textbooks and Materials:
Elementary Statistics: Picturing the World. 6th ed. Larson, Ron and Farber, Betsy. Pearson. 2015
Elementary Statistics. 12th ed. Triola, Mario. Pearson. 2014 (classic)
Elementary Statistics, A Step by Step Approach. 9th ed. Bluman, Allan. McGraw-Hill. 2013 (classic)
Modern Elementary Statistics. 12th ed. Freund, John and Perles, Benjamin. Pearson. 2007 (classic)

OTHER REQUIRED ELEMENTS

STUDENT PREPARATION

Matric Assessment Required:	M	Requires Math Assessment
Prerequisites-generate description:	U	User Generated Text
Advisories-generate description:	NA	No Advisory
Prereq-provisional:	N	NO
Prereq/coreq-registration check:	Y	Prerequisite Rules Exist
Requires instructor signature:	N	Instructor's Signature Not Required

BASIC INFORMATION, HOURS/UNITS & REPEATABILITY

Method of instruction:	02	Lecture
	72	Internet-Based, Delayed Interaction
	71	Internet-Based, Simultaneous Interaction
Area department:	MATH	Mathematics
Division:	73	Science, Technology, Engineering & Mathematics
Special topic course:	N	Not a Special Topic Course
Program status:	1	Both Certificate and Major Applicable
Repeatability:	00	Two Repeats if Grade was D, F, NC, or NP
Repeat group id:		

SCHEDULING

Audit allowed:	N	Not Auditable
Open entry/exit:	N	Not Open Entry/Open Exit
Credit by exam:	N	Credit by examination not allowed
Budget code: Program:	0000	Unrestricted
Budget code: Activity:	1701	Mathematics-General

OTHER CODES

Discipline:	Mathematics	
Basic skills:	N	Not a Basic Skills Course
Level below transfer:	Y	Not Applicable
CVU/CVC status:	Y	Distance Ed, Not CVU/CVC Developed
Distance Ed Approved:	Y	Hybrid (i.e., a mix of face-to-face and technology-based instruction)
Emergency Distance Ed Approved:	Y	Fully Online
		Partially Online
		Online with flexible in-person activities
Credit for Prior Learning:	N	Agency Exam
	N	CBE
	N	Industry Credentials
	N	Portfolio
Non-credit category:	Y	Not Applicable, Credit Course
Classification:	Y	Liberal Arts and Sciences Courses
SAM classification:	E	Non-Occupational
TOP code:	1701.00	Mathematics, General
Work-based learning:	N	Does Not Include Work-Based Learning
DSPS course:	N	Not a DSPS Course

In-service: N Not an in-Service Course