

# BS STATISTICS

## Program Learning Objectives

1. Have good working knowledge of the most commonly used statistical methods, including statistical modeling and omnipresent role of variability, efficient design of studies and construction of effective sampling plans, exploratory data analysis, and formal inference process.
2. Have background in probability, statistical theory, and mathematics, including especially calculus, linear algebra and symbolic and abstract thinking.
3. Be able to synthesize and apply knowledge of common inferential methods, understanding the limitations of procedures and appropriate conclusions.
4. Communicate effectively (written and oral) with skills in collaboration (within and between disciplines) and teamwork, and in organizing and managing projects.
5. Have a good mastery of several standard statistical software packages and facility with data management strategies.
6. Have a focused concentration in an area of application outside the discipline of statistics.

## Degree Requirements and Curriculum

In addition to the program requirements listed on this page, students must also satisfy requirements outlined in more detail in the Minimum Requirements for Graduation (<https://catalog.calpoly.edu/generalrequirementsbachelorsdegree/#generaleducationtext>) section of this catalog, including:

- 60 units of upper-division courses
- Graduation Writing Requirement (GWR)
- 2.0 GPA
- U.S. Cultural Pluralism (USCP)

Note: No course with a STAT prefix may be selected as credit/no credit.

### MAJOR COURSES

STAT 150	Introduction to the Discipline of Statistics	2
MATH 141	Calculus I (B4) <sup>1</sup>	4
MATH 142	Calculus II (GE Electives) <sup>1</sup>	4
MATH 143	Calculus III	4
MATH 206	Linear Algebra I	4
MATH 241	Calculus IV	4
STAT 301	Statistics I	4
STAT 302	Statistics II	4
STAT 305	Introduction to Probability and Simulation	4
STAT 323	Design and Analysis of Experiments I	4
STAT 330	Statistical Computing with SAS	4
STAT 331	Statistical Computing with R	4
STAT 334	Applied Linear Models	4
STAT 365	Statistical Communication	2
STAT 425	Probability Theory	4
STAT 426	Estimation and Sampling Theory	4
STAT 427	Mathematical Statistics	4

STAT 466	Senior Project - Statistical Consulting	4
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### Statistics Electives:

Select from List A below: 12

STAT 405	Applied Probability Models
STAT 414	Multilevel and Mixed Modeling
STAT 415	Bayesian Reasoning and Methods
STAT 416	Statistical Analysis of Time Series
STAT 417	Survival Analysis Methods
STAT 418	Categorical Data Analysis
STAT 419	Applied Multivariate Statistics
STAT 421	Survey Sampling and Methodology
STAT 423	Design and Analysis of Experiments II
STAT 434	Statistical Learning: Methods and Applications

Select from List B below: 12

Any 400-level STAT course (including those in List A)	
CSC/CPE 202	Data Structures
CSC/CPE 203	Project-Based Object-Oriented Programming and Design
CSC 248	Discrete Structures
CSC 349	Design and Analysis of Algorithms
CSC 365	Introduction to Database Systems
CSC 369	Introduction to Distributed Computing
DATA 301	Introduction to Data Science
IME 430	Quality Engineering
ITP 303	Lean Six Sigma Green Belt
MATH 242	Differential Equations I
MATH 306	Linear Algebra II
MATH 334	Combinatorial Math
MATH 335	Graph Theory
MATH 406	Linear Algebra III
MATH 412	Introduction to Analysis I
MATH 413	Introduction to Analysis II
MATH 414	Introduction to Analysis III
MATH 437	Game Theory
MATH 451	Numerical Analysis I

### SUPPORT COURSES

CSC/CPE 101	Fundamentals of Computer Science	4
MATH 248	Methods of Proof in Mathematics	4
Approved Support Electives <sup>2</sup>		8

### GENERAL EDUCATION (GE)

(See GE program requirements below.) 64

### FREE ELECTIVES

Free Electives 8

**Total units 180**

<sup>1</sup> Required in Major or Support; also satisfies General Education (GE) requirement.

<sup>2</sup> Consultation with faculty advisor is required of students, to select and obtain approval for these courses. Students are requested to consult their advisors before the start of their junior year.

## General Education (GE) Requirements

- 72 units required, 8 of which are specified in Major and/or Support.
- If any of the remaining 64 units is used to satisfy a Major or Support requirement, additional units of Free Electives may be needed to complete the total units required for the degree.
- See the complete GE course listing (<https://catalog.calpoly.edu/generalrequirementsbachelorsdegree/#generaleducationtext>).
- A grade of C- or better is required in one course in each of the following GE Areas: A1 (Oral Communication), A2 (Written Communication), A3 (Critical Thinking), and B4 (Mathematics/Quantitative Reasoning).

<sup>1</sup> Required in Major or Support; also satisfies General Education (GE) requirement.

<b>Area A</b>	<b>English Language Communication and Critical Thinking</b>	
A1	Oral Communication	4
A2	Written Communication	4
A3	Critical Thinking	4
<b>Area B</b>	<b>Scientific Inquiry and Quantitative Reasoning</b>	
B1	Physical Science	4
B2	Life Science	4
B3	One lab taken with either a B1 or B2 course	
B4	Mathematics/Quantitative Reasoning (4 units in Major) <sup>1</sup>	0
Upper-Division B		4
<b>Area C</b>	<b>Arts and Humanities</b>	
Lower-division courses in Area C must come from three different subject prefixes.		
C1	Arts: Arts, Cinema, Dance, Music, Theater	4
C2	Humanities: Literature, Philosophy, Languages other than English	4
Lower-Division C Elective - Select a course from either C1 or C2		4
Upper-Division C		4
<b>Area D</b>	<b>Social Sciences - Select courses in Area D from at least two different prefixes</b>	
D1	American Institutions (Title 5, Section 40404 Requirement)	4
D2	Lower-Division D	4
Upper-Division D		4
<b>Area E</b>	<b>Lifelong Learning and Self-Development</b>	
Lower-Division E		4
<b>Area F</b>	<b>Ethnic Studies</b>	
F	Ethnic Studies	4
<b>GE Electives in Areas B, C, and D</b>		
Select courses from two different areas; may be lower-division or upper-division courses.		
GE Electives (4 units in Major plus 4 units in GE) <sup>1</sup>		4
<b>Total units</b>		<b>64</b>