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

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

Statistics Electives:
Select from List A below: 12

<table>
<thead>
<tr>
<th>Course</th>
<th>Title</th>
<th>Units</th>
</tr>
</thead>
<tbody>
<tr>
<td>STAT 405</td>
<td>Applied Probability Models</td>
<td></td>
</tr>
<tr>
<td>STAT 414</td>
<td>Multilevel and Mixed Modeling</td>
<td></td>
</tr>
<tr>
<td>STAT 415</td>
<td>Bayesian Reasoning and Methods</td>
<td></td>
</tr>
<tr>
<td>STAT 416</td>
<td>Statistical Analysis of Time Series</td>
<td></td>
</tr>
<tr>
<td>STAT 417</td>
<td>Survival Analysis Methods</td>
<td></td>
</tr>
<tr>
<td>STAT 418</td>
<td>Categorical Data Analysis</td>
<td></td>
</tr>
<tr>
<td>STAT 419</td>
<td>Applied Multivariate Statistics</td>
<td></td>
</tr>
<tr>
<td>STAT 421</td>
<td>Survey Sampling and Methodology</td>
<td></td>
</tr>
<tr>
<td>STAT 423</td>
<td>Design and Analysis of Experiments II</td>
<td></td>
</tr>
<tr>
<td>STAT 434</td>
<td>Statistical Learning: Methods and Applications</td>
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</tr>
<tr>
<td>STAT 543</td>
<td>Advanced Design and Analysis of Experiments</td>
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<tr>
<td>STAT 545</td>
<td>Applied Stochastic Processes</td>
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<tr>
<td>STAT 550</td>
<td>Generalized Linear Models</td>
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</tr>
<tr>
<td>STAT 551</td>
<td>Statistical Learning with R</td>
<td></td>
</tr>
</tbody>
</table>

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
- STAT 541 Advanced Statistical Computing with R
- STAT 543 Advanced Design and Analysis of Experiments
- STAT 545 Applied Stochastic Processes
- STAT 550 Generalized Linear Models
- STAT 551 Statistical Learning with R

SUPPORT COURSES

<table>
<thead>
<tr>
<th>Course</th>
<th>Title</th>
<th>Units</th>
</tr>
</thead>
<tbody>
<tr>
<td>CSC/CPE 101</td>
<td>Fundamentals of Computer Science</td>
<td>4</td>
</tr>
<tr>
<td>MATH 248</td>
<td>Methods of Proof in Mathematics</td>
<td>4</td>
</tr>
<tr>
<td>Approved Support Electives</td>
<td>8</td>
<td></td>
</tr>
</tbody>
</table>
GENERAL EDUCATION (GE)  
(See GE program requirements below.)  

FREE ELECTIVES  
Free Electives  

Total units  

180  

1 Required in Major or Support; also satisfies General Education (GE) requirement.  
2 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).  

Area A  
English Language Communication and Critical Thinking  
A1 Oral Communication  
A2 Written Communication  
A3 Critical Thinking  

Area B  
Scientific Inquiry and Quantitative Reasoning  
B1 Physical Science  
B2 Life Science  
B3 One lab taken with either a B1 or B2 course  
B4 Mathematics/Quantitative Reasoning (4 units in Major)  

Upper-Division B  

Area C  
Arts and Humanities  
Lower-division courses in Area C must come from three different subject prefixes.  
C1 Arts: Arts, Cinema, Dance, Music, Theater  
C2 Humanities: Literature, Philosophy, Languages other than English  

Lower-Division C Elective - Select a course from either C1 or C2  

Upper-Division C  

Area D  
Social Sciences - Select courses in Area D from at least two different prefixes  
D1 American Institutions (Title 5, Section 40404 Requirement)  
D2 Lower-Division D  

Upper-Division D  

Area E  
Lifelong Learning and Self-Development  

Lower-Division E  

Area F  
Ethnic Studies  

F Ethnic Studies  

GE Electives in Areas B, C, and D  
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)  

Total units  

64  

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