University of Pittsburgh | Dietrich School

Statistics Major and Applied Statistics Minor

The field of statistical science is concerned with ways to explain variability in measurements. It is the science and art of making informed decisions in the face of uncertainties. Statistical reasoning is fundamental to research in many scientific fields. For example, probabilistic models of learning are used in education and psychology, and time series and regression models guide research in engineering, chemistry, economics, biology, and medicine. Recent high-profile court cases have shown the importance of the use of probability and statistics in law, especially in the fields of forensic medicine and DNA fingerprinting. Statisticians have also been instrumental in developing methods by which observations are obtained in many disciplines, such as randomized clinical trials in medicine and complex sample surveys in social and political science. Probability and statistics are basic to the actuarial sciences. When lists are compiled of the most important scientific theories and discoveries of the last century, a substantial number of these developments are seen to be inherently statistical in nature.

The Department of Statistics offers coursework leading to a bachelor's degree in statistics. The department also offers a wide array of introductory service courses for general undergraduate audiences; these courses deal with statistical methods in applications that require only high school mathematics. Students considering majoring in statistics should consult with the departmental advisor early in their studies, preferably during their freshman year.

Required courses for the Statistics major

The statistics major requires the completion of 50 credits in statistics and mathematics, distributed as follows.

Required course
STAT 1000 Applied Statistical Methods

With the approval of the major advisor, students may make substitutions for STAT 1000 under the conditions outlined below.
- STAT 0200 with a grade of B- or better; or
- Advanced Placement credit for STAT 0200; or
- STAT 1100 if the student is a Statistics-Business dual major.

Both of the following courses
STAT 1221 Applied Regression
STAT 1223 Applied Regression Writing Practicum

Both of the following courses
STAT 1151 Introduction to Probability
STAT 1152 Introduction to Mathematical Statistics

Introductory applied statistics courses; chose two courses
STAT 1201 Applied Nonparametric Statistics
STAT 1211 Applied Categorical Data Analysis
STAT 1231 Applied Experimental Design
STAT 1241 Applied Sampling
STAT 1251 Statistical Quality Control
STAT 1261 Principles of Data Science

Intermediate applied statistics courses

Choose one course
STAT 1301 Statistical Packages
STAT 1311 Applied Multivariate Analysis
STAT 1321 Applied Time Series
STAT 1361 Statistical Learning and Data Science

Both of the following courses
STAT 1631 Intermediate Probability
STAT 1632 Intermediate Mathematical Statistics

One of the following courses
STAT 1731 Stochastic Processes
STAT 1741 Applied Probability Theory

One elective course from the lists of introductory or intermediate applied statistics courses, or from the following list
STAT 1731 Stochastic Processes
STAT 1741 Applied Probability Theory

Mathematics courses; choose one of the following groups
MATH 0220 Analytic Geometry and Calculus 1
MATH 0230 Analytic Geometry and Calculus 2
MATH 0240 Analytic Geometry and Calculus 3

MATH 0220 Analytic Geometry and Calculus 1
MATH 0235 Honors 1 Variable Calculus
MATH 0240 Analytic Geometry and Calculus 3

One of the following courses
MATH 0280 Introduction to Matrices and Linear Algebra
MATH 1180 Linear Algebra 1
MATH 1185 Honors Linear Algebra

Recommended courses
Because professional statisticians collaborate with other scientists, students are encouraged to take elective courses from the behavioral, natural, physical, and social sciences. Students who plan to study statistics at the graduate level are strongly advised to take MATH 0413 and MATH 0420, or MATH 0450 (in lieu of both MATH 0413 and MATH 0420), MATH 1180, and as many additional mathematics courses in advanced calculus (MATH 1530, 1540), numerical analysis (MATH 1070, 1110), and computer science courses (CS 0007, 0132, 0401, 0445, 0447) as possible.

Grade requirements
A grade of C or better is required in each course that is to count toward the major.

Satisfactory/No Credit option
No course that counts toward the major can be taken on an S/NC basis.

Writing (W) requirement
Students must complete at least one W-course in the major.

Honors major requirement
Honors in statistics is granted if in addition to fulfilling all requirements for the major, the student:
- has a minimum GPA of 3.5 in all mathematics and statistics courses taken; and
- has a minimum GPA of 3.7 in all 1000-level courses taken within the department.

Advising
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Checklist for the Statistics major

Required courses
_____ STAT 1000
_____ STAT 1221
_____ STAT 1223
_____ STAT 1151
_____ STAT 1152

Two of the following introductory applied statistics courses
_____ STAT 1201
_____ STAT 1211
_____ STAT 1231
_____ STAT 1241
_____ STAT 1251
_____ STAT 1261
_____ STAT 1291
_____ STAT 1292
_____ STAT 1293
_____ STAT 1294

Intermediate applied statistics courses; choose one course
_____ STAT 1301
_____ STAT 1311
_____ STAT 1321
_____ STAT 1361

Both of the following courses
_____ STAT 1631   _____ STAT 1632

One of the following courses
_____ STAT 1731   _____ STAT 1741

One elective course from the lists of introductory or intermediate applied statistics courses, or from the following list
_____ STAT 12_____   _____ STAT 1731
_____ STAT 13_____   _____ STAT 1741

Four mathematics courses; choose one of the following groups
_____ MATH 0220   _____ MATH 0220
_____ MATH 0230   _____ MATH 0235
_____ MATH 0240   _____ MATH 0240

One of the following courses
_____ MATH 0280
_____ MATH 1180
_____ MATH 1185

Checklist for the Applied Statistics minor

_____ STAT 1000 [1]
_____ STAT 1221
_____ STAT 1_____ (1200-level or above) [2]
_____ STAT 1_____ (1200-level or above)
_____ STAT 1_____ (1200-level or above)

1. Acceptable substitutes include ENGR 0020, STAT 0200, or STAT 1100.
2. STAT 1223 does not count toward the minor.

Note: Students must apply for any official minor they will complete or have completed at the time they apply for graduation.