STATISTICS, BA

Degree: Bachelor of Arts (BA)
Major: Statistics

Program Overview

All undergraduate degrees in the department are based on a four-course sequence in calculus and differential equations and have a computational component. The statistics degrees all require a further statistics core and a minimum of 120 credit hours.

Students in statistics begin with a foundation in mathematics. Then they add statistical theory, plus intensive modern data analysis and a concentration in a field of their choice. The goal is to develop an appreciation of each facet of the discipline and a mastery of technical skills. This prepares students to enter a growing profession with opportunities in the academic, governmental, actuarial, and industrial spheres.

Learning Outcomes

- Students will be able to know the fundamental concepts of probability theory, random variables, probability distributions, moments, and the transformation of random variables.
- Students will be able to correctly identify appropriate probability models for a given random phenomenon and demonstrates the capability of finding distributions of functions of random variables and properties thereof.
- Students will be able to know the fundamental concepts of the central limit theorem, law of large numbers, theory of estimation, and hypothesis testing.
- Students will be able to demonstrate the capability of setting up the mathematical proof for finding large sample properties of estimators and/or is able to construct appropriate statistical inferential procedures using such estimators.
- Students will be able to know the fundamental concepts of linear regression models and is trained with appropriate statistical software for exploratory data analysis, data visualization, building regression models, carrying out statistical inferences, and validations of model assumptions.
- Students will be able to formulate an appropriate linear regression model for a given problem, is able to fit such a model and use it for statistical inference, and/or identify its limitations.
- Students will be able to express a given research problem in quantitative and statistical terms, finds the appropriate set of statistical methods and/or models to solve the problem, and is able to implement them using appropriate statistical software that leads to the solution of the problem.
- Students will be able to effectively communicate the statistical analysis to a non-expert in statistics and is able to put the work in the proper context in the form of a technical report.

Undergraduate Policies

For undergraduate policies and procedures, please review the Undergraduate Academics section of the General Bulletin.

Accelerated Master's Programs

Undergraduate students may participate in accelerated programs toward graduate or professional degrees. For more information and details of the policies and procedures related to accelerated studies, please visit the Undergraduate Academics section of the General Bulletin.

Program Requirements

Students seeking to complete this major and degree program must meet the general requirements for bachelor's degrees and the Unified General Education Requirements. Students completing this program as a secondary major while completing another undergraduate degree program do not need to satisfy the school-specific requirements associated with this major.

The BA degree in statistics requires a minimum of 50 credit hours of approved coursework, including 27 credit hours in statistics and the remainder in related disciplines and a substantive field of application. The specific requirements are as follows:

Code	Title	Credit Hours
Required Courses:		
MATH 121	Calculus for Science and Engineering I	4
MATH 122	Calculus for Science and Engineering II	4
or MATH 124	Calculus II	
MATH 223	Calculus for Science and Engineering III	3
or MATH 227	Calculus III	
MATH 224	Elementary Differential Equations	3
or MATH 228	Differential Equations	
MATH 201	Introduction to Linear Algebra for Applications	3
STAT 325	Data Analysis and Linear Models	3
STAT 326	Multivariate Analysis and Data Mining	3
STAT 345	Theoretical Statistics I	3
STAT 346	Theoretical Statistics II	3
ENGR 131	Elementary Computer Programming	3
Advanced-level computation course [a]		3
Statistical Methodology courses [b]		15
Total Credit Hours		**50**

a   Chosen in consultation with advisor.
b   To be chosen from STAT courses 300-level and higher, or approved courses in statistical methodology or probability taught in biostatistics, electrical engineering, and computer science, economics, mathematics, operations research, systems engineering, etc. At least 9 credit hours must be in STAT. STAT 243 and STAT 244 may be counted.

Concentration Requirements

Actuarial Science Concentration

A student interested in Actuarial Science should take STAT 317 and STAT 318 among the 18 hours in statistical methodology, and should discuss with their advisor courses in operations research and numerical analysis which are fundamental to actuarial theory and computation.