STATE UNIVERSITY OF NEW YORK AT BUFFALO

DEPARTMENT OF BIOSTATISTICS

UNDERGRADUATE STUDENT HANDBOOK

Updated April 11, 2023

UB

Undergraduate Programs:
BA Statistics
Minor in Statistics

Teaching Philosophy

We believe in a holistic approach to education. The Department is dedicated to providing a wide variety of educational, research, and collaborative opportunities to students in a friendly, respectful, nurturing, and stimulating environment that promotes intellectual and professional development.

Department of Biostatistics
Interim Chair and Associate Professor

Jeffrey Miecznikowski, PhD   Carnegie Mellon University
Research interests: Research interests: bio-technical image analysis, array comparative genomic hybridization (aCGH) analysis, microarray analysis, nonparametric statistics, bootstrap methods, and software development

Undergraduate Faculty

Undergraduate Director
Research Professor
Dietrich Kuhlmann, PhD   University of Missouri

Research Assistant Professor

Joseph Consiglio, PhD   University at Buffalo

Jonathan Lopez, PhD   University of Rochester

Personnel: Staff

Joanna McCarthy   Resource Manager

Noreen D. McGuire   Academic Program Coordinator

Teresa Sikorski   Department Secretary

BA Statistics

From assessing public opinions through surveys to forecasting business trends to evaluating the effectiveness of medical treatments, there is and will continue to be a demand for individuals who can provide a statistical skill set.

With a bachelor's degree, you will:

- Gain a solid knowledge base in various aspects of statistical theory, methods and applications.
- Advance to graduate or professional study.
- Prepare for success across countless industries, the government and academia.

Requirements and Curriculum

This major requires a minimum of 51 credit hours of coursework. Additional credit hours are required for the bachelor's degree.

Credits Required for Major	51
Additional Credits Required for UB Curriculum	33
Additional Credits Required for Electives	36
Total Credits Required for Degree	120

Core Required Courses

- STA 119 Statistical Methods *
- STA 301 Introduction to Probability

- STA 302 Introduction to Stat. Inference
- STA 403 Regression Analysis
- STA 404 Design of Experiments

Elective Courses

At least three of the following:

- STA 306 Statistical Computing w/SAS I
- STA 309 Statistical Quality Control
- STA 361 Statistical Programming in R (1)
- STA 411 Stochastic Processes
- STA 415 Distribution Free Inference
- STA 431 Methods of Survey Samples
- STA 461 Applied Time Series Analysis
- STA 471 Topics in Statistics I
- STA 472 Topics in Statistics II
- MTH 311 Intro to Higher Mathematics can be substituted for an elective

One of the following can be substituted for an elective:

- MTH 311 Intro to Higher Mathematics
- Any CSE 300 – 400 level course

Additional Required Courses

Five courses from other departments (or their equivalents) are required. Students intending to pursue graduate work in statistics are strongly encouraged to take additional mathematics courses.

- PUB 101 Intro to Public Health
- MTH 141 College Calculus I
- MTH 142 College Calculus II
- MTH 241 College Calculus III
- MTH 309 Introductory Linear Algebra
- CSE 115 Introduction to Computer Science for Majors I (4)

*Registration in this course provides the student with a stats lab resource with a teaching assistant in 806 Kimball. The teaching assistant is available

for questions. Please check the hours of the stats lab as they change each semester. Student sign in sheet is required.

Minor in Statistics

Our department also offers a Minor in Statistics. This program provides you with a calculus-based foundation in probability and statistics before progressing into numerous areas of application

The minor requires seven courses for a total of 26 credits, and a minimum GPA of 2.5 in the first three prerequisite or lower-division courses.   All University graduation requirements must be met as well.

Lower-Division Courses

These courses will introduce you to the statistical concepts developed in the upper-division courses.

- MTH 141 College Calculus I
- MTH 142 College Calculus II
- STA 119 Introduction to Statistical Methods

Upper-Division Courses

- STA 301 Introduction to Probability
- STA 302 Introduction to Statistical Inference
- STA 403 Regression Analysis
- STA 404 Analysis-of-Variance

Administrative Requirements

The Undergraduate Catalog (http://undergrad-catalog.buffalo.edu/) contains official information regarding university policies. Please

consult it for information regarding, for example, University graduation requirements, course grade policies, academic dishonesty policy, registration, student records, Application for Degree Form.

Questions about program requirements or curriculum?

Contact undergraduate advisement at sphhp-oasa@buffalo.edu or (716) 829-5000.

Course Descriptions
Unless otherwise specified, courses are 3 credit courses.

STA 119 Statistical Methods (4)
Covers topics in descriptive statistics, probability, inference, and experimental design, all of which are put together to draw conclusions from uncertainty through analysis of experimental data. Although a general statistical methods course, the material (through examples) is geared towards sciences majors, especially those in the health sciences. The underlying reasoning behind the techniques will be explored.

STA 301 Introduction to Probability (4)
Provides students with probability and distribution theory necessary for the study of statistics. Topics include axioms of probability theory, independence, conditional probability, random

variables, discrete and continuous probability distributions, functions of random variables, moment generating functions, the Law of Large Numbers, and the Central Limit Theorem.

STA 302 Introduction to Statistical Inference (4)
Introduces principles of statistical inference. Introduces and develops classical methods of estimation, tests of significance, the Neyman-Pearson

Theory of testing hypotheses, maximum likelihood methods, and Bayesian statistics.

STA 306 Intro to Statistical Computing w/SAS I

The purpose of this course is to familiarize students with PC-based statistical computing applications for public health. This course will develop basic skills in the use of a statistical package through classroom demonstrations and independent lab assignments. The course will emphasize data definition, verification, descriptive and inferential statistics, and graphical presentation. The course should familiarize the students with the use of a statistical package and give them the skills needed for effective data management, data manipulation, and data analysis at a basic level. Pre-Requisite STA 119 or permission of instructor

STA 309 Stat Quality Control

STA 403 Regression Analysis

Covers regression analysis and introduction to linear models. Topics include point estimation, confidence intervals, hypothesis testing, simple linear regression, multiple regression, analysis of covariance, and non-linear regression. The course uses statistical software and emphasizes hands-on applications to data sets from a variety of settings. Prequisite: STA 301 and STA 302

STA 404 Design of Experiments

Covers statistical methods for planning, conducting, and analyzing experiments to optimize a process. Topics include point estimation, confidence intervals, hypothesis testing, ANOVA models for 1, 2, and k-way classifications, multiple comparisons, randomized complete block designs, Latin square designs, and factorial designs. The course uses statistical software and emphasizes hands-on applications to data sets from a variety of settings.

STA 411 Stochastic Processes

STA 415 Distribution Free Inference

STA 431 Methods of Survey Samples

STA 461 Applied Time Series Analysis

STA 471 Topics in Statistics I

STA 472 Topics in Statistics II