STATE UNIVERSITY OF NEW YORK
AT BUFFALO

DEPARTMENT OF BIOSTATISTICS

UNDERGRADUATE STUDENT HANDBOOK

Updated October 28, 2022
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
Chair and Professor
Gregory E. Wilding, PhD  
University of Rochester
Research interests: clinical trial design, permutation tests, resampling techniques, goodness-of-fit tests, distributional characterizations, copulas, tests of independence, biostatistics.

Undergraduate Faculty

Undergraduate Director
Research Professor
Dietrich Kuhlmann, PhD  
University of Missouri

Clinical Associate Professor
Jonathan Lopez, PhD  
University of Rochester

Research Assistant Professor
Joseph Consiglio, PhD  
University at Buffalo
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.

<table>
<thead>
<tr>
<th>Credits Required for Major</th>
<th>51</th>
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<tbody>
<tr>
<td>Additional Credits Required for UB Curriculum</td>
<td>33</td>
</tr>
<tr>
<td>Additional Credits Required for Electives</td>
<td>36</td>
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<tr>
<td>Total Credits Required for Degree</td>
<td>120</td>
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</tbody>
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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 Intro to Statistical Computing w/SAS I
- STA 309 Statistical Quality Control
- STA 361 Statistical Programming in R I
- STA 406 Statistical Computing
- 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

**Additional Required Courses**

Six 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/](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 sphp-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 Statistical Quality Control

STA 361 Statistical Programming in R (I)

This is an undergraduate course in statistical analysis using R (RStudio interface). The course is designed to provide a practical overview of programming logic, data manipulation concepts, and statistical analysis through an emphasis on core concepts. Topics covered include basic control structures, object classes, data reshaping via the “dplyr” library of functions, data visualization using the “ggplot2” package, basic probability functions, functions used to carry out statistical inferences common in an undergraduate setting, simulated generation of random variables, and writing custom functions.

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
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**