# M.S. IN BIOSTATISTICS

http://www.biostat.med.miami.edu/academics/ms-in-biostatistics/

## Overview

The Master of Science (MS) in Biostatistics is an applied graduate program intended for students seeking training in applied biostatistics. The program emphasizes applications and understanding of statistical concepts rather than theoretical and mathematical principles. The program is meant to be a terminal degree providing students with the necessary background for applying good biostatistical practices in real-world settings. Students will gain practical skills that can be applied immediately to a variety of data settings, which includes, but not limited to, the biological life sciences public health, medical studies, and health services outcome research.

The degree consists of 33 credits in a 10-month period (3 semesters) covering introductory probability and mathematical statistics, regression modeling, statistical computing, design and analysis of clinical trials, survival analysis, machine learning and fundamentals of epidemiology and public health. Enrichment will be provided by a statistical practicum and a seminar course varying with special topics.

Pre-requisites include:

1. Introductory calculus
2. Introductory computing
3. Introductory statistics/biostatistics

## Admission Requirements

**Master of Science in Biostatistics (MS) - Admission Requirements**

- All applicants for the Master of Science in Biostatistics program must submit the following items on SOPHAS (https://nam10.safelinks.protection.outlook.com/?url=https%3A%2F%2Fsophas.liaisoncas.com%2Fapplicant-ux%2F%23%2Fdeeplink%2FprogramSearch%2Forganization%2F1034082811816155136.&data=05%7C02%7CHRose%40med.miami.edu%7Ce388d33512f243609f3f08dc387a54f0%7C2a144b72f23942d48c0e6f0f17c48e33%7C0%7C0%7C638447345285281464%7CUnknown%7CTWFpbGZsb3d8eyJWIjoiMC4wLjAwMDAiLCJQIjoiV2luMzIiLCJBTiI6Ik1haWwiLCJXVCI6Mn0%3D%7C0%7C%7C%7C&sdata=ofbijlyVHGXeLXtaQyG8ApMqFLBu%2B7sHelvIjJXaFi4%3D&reserved=0):
  - Application fee
  - Curriculum Vitae/Resume
  - Three letters of recommendation
  - Statement of Purpose/Personal statement
  - Official transcripts from every post-secondary school attended
- This graduate degree program also requires submission of certain supplemental materials, including:
  - TOEFL/IELTS score, as applicable
  - Foreign evaluation on international transcripts, as applicable

For more detailed information, please visit our Public Health Sciences Graduate Studies Admission Website (https://graduatestudies.publichealth.med.miami.edu/admissions/application-process/).

For further information, please contact:

**Ginelle Solis, EdD, MPA**
**Director of Admissions and Recruitment**
**Department of Public Health Sciences**
**University of Miami Miller School of Medicine**
**Tel: 305-243-7246**
**Email: publichealthadmissions@miami.edu**

## Curriculum Requirements

| Code | Title | Credit Hours |
|---|---|---|
| BST 605 | Statistical Principles of Clinical Trials | 3 |
| BST 610 | Introduction to Statistical Collaboration | 3 |
| BST 625 | Survey of Statistical Computing | 3 |
| BST 650 | Topics in Biostatistical Research [1] | 2 |
| BST 692 | Data Science and Machine Learning for Health Research | 3 |
| EPH 600 | Introduction to the Science Practice of Public Health | 3 |

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|---|---|---|
| EPH 621 | Fundamentals of Epidemiology | 3 |
| EPH 703 | Advanced Statistical Methods I | 4 |
| EPH 705 | Advanced Statistical Methods II | 3 |
| EPH 751 | Survival Analysis in Clinical Trials | 3 |
| BST 603 | An Introduction to Probability Theory and Its Applications | 3 |
| **Total Credit Hours** | | **33** |

[1] BST 650 is taken for 1 credit in fall and 1 credit in spring.

# Plan of Study (10-month)

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|---|---|---|
| **First Year** | | |
| **Fall** | | **Credit Hours** |
| BST 625 | Survey of Statistical Computing | 3 |
| BST 650 | Topics in Biostatistical Research | 1 |
| EPH 600 | Introduction to the Science Practice of Public Health | 3 |
| EPH 703 | Advanced Statistical Methods I | 4 |
| BST 603 | An Introduction to Probability Theory and Its Applications | 3 |
| | **Credit Hours** | **14** |
| **Spring** | | |
| BST 605 | Statistical Principles of Clinical Trials | 3 |
| BST 650 | Topics in Biostatistical Research | 1 |
| EPH 621 | Fundamentals of Epidemiology | 3 |
| EPH 705 | Advanced Statistical Methods II | 3 |
| EPH 751 | Survival Analysis in Clinical Trials | 3 |
| | **Credit Hours** | **13** |
| **Summer** | | |
| BST 610 | Introduction to Statistical Collaboration | 3 |
| BST 692 | Data Science and Machine Learning for Health Research | 3 |
| | **Credit Hours** | **6** |
| | **Total Credit Hours** | **33** |

# Mission

The mission of the Graduate Programs in Public Health is to develop leaders who can generate and translate knowledge into policy and practice to promote health and prevent disease in human populations.

# Goals

Upon completion of the Master of Science (MS) in Biostatistics degree, all graduates will be able to:

- Apply epidemiologic and statistical methods to the measurement and study of population health and the prevention of infectious and chronic disease.
- Describe concepts in probability theory, random variation and commonly used statistical distribution and mathematical statistics.
- Develop sample size and power calculations for different study designs including those from clinical trials and observational studies.
- Perform a variety of basic and advanced statistical analyses (estimation and inference) including ANOVA, univariate and multiple regression models, generalized linear modeling, multivariate analysis, survival analysis, design of experiments, various new techniques from statistical learning theory, analyze cross-sectional data.
- Apply quantitative and reasoning skills, as well as content-area knowledge, to analyze data from epidemiological, clinical, observational and experimental studies.
- Interpret results from explanatory and descriptive data analysis and advanced statistical analyses to draw relevant conclusions from data.
- Develop a high level of competency in statistical programming both with SAS and R for both managing and analyzing data.
- Communicate effectively by producing summary reports, statistical analysis sections of papers, graphical summaries and tabular summaries of the data.
- Gain successful practical experience in statistical consulting, including interaction with research faculty in the health sciences.

## Student Learning Outcomes

- Students will develop and demonstrate effective written and oral communication skills in the presentation of public health information.
- Students will demonstrate mastery of applied statistical data analysis techniques.
- Students will develop and demonstrate the ability to make scholarly contributions to the biomedical sciences through effective statistical collaborating efforts.
- Students will master at least one statistical analysis software for data management and statistical analysis techniques.