

BIostatISTICS (PHD)

This program will prepare you for advanced study and research in biostatistics. It's a great fit for students with a strong background in mathematics and statistics who are interested in working in health care and biological settings. As a student in this program, you'll function as an independent investigator or co-investigator with researchers in other areas, taking the lead in designing studies and analyses. Our faculty (<https://coloradosph.cuanschutz.edu/education/departments/biostatistics-informatics/directory/>) are studying the analysis of longitudinal data, clinical trials, statistical methods in genetics and genomics, causal modeling, treatment of missing data and imputation, image analysis, functional data analysis, and data visualization, which means you can find the mentor who's right for you.

If you have an MS in Biostatistics or a related field, this program can be completed in three to four years. Typically, you'll spend the first one to two years devoted to coursework and the later years on research and your dissertation. Research and dissertation work involves developing, comparing, and evaluating statistical methods (e.g. methods for analyzing data), typically motivated by an application in healthcare or biology.

Curriculum

| Code | Title | Hours |
|--------------------------------------------------------------------|-----------------------------------------------------|-------|
| Required MS Biostatistics Courses (20 credits) | | |
| BIOS 6611 | Biostatistical Methods I | 3 |
| BIOS 6612 | Biostatistical Methods II | 3 |
| BIOS 6621 | Statistical Consulting I | 1 |
| BIOS 6622 | Statistical Consulting II | 1 |
| BIOS 6624 | Advanced Statistical Methods and Analysis | 3 |
| BIOS 6631 | Statistical Theory I | 3 |
| BIOS 6632 | Statistical Theory II | 3 |
| BIOS 6643 | Analysis of Longitudinal Data | 3 |
| Required Public Health Courses (6 credits) | | |
| PUBH 6600 | Foundations in Public Health | 2 |
| EHOH 6601 | Public Health Concepts for Non-MPH | 1 |
| EPID 6630 | Epidemiology | 3 |
| MS Elective Courses (6 credits from the following courses): | | |
| BIOS 6641 | Causal Inference | 3 |
| BIOS 6642 | Introduction to Python Programming | 3 |
| BIOS 6645 | Predictive Analytics | 3 |
| BIOS 6646 | Survival Analysis | 3 |
| BIOS 6649 | Clinical Trials: Statistical Design and Monitoring | 3 |
| BIOS 6655 | Statistical Methods for Genetic Association Studies | 3 |
| BIOS 6660 | Analysis of Genomic Data using R and Bioconductor | 3 |
| Required PhD Biostatistics Courses (6 credits) | | |
| BIOS 7731 | Advanced Mathematical Statistics I | 3 |
| BIOS 7732 | Theory/Algorithms Data Science | 3 |
| PhD Electives (9 credits from the following courses): | | |
| BIOS 7659 | Statistical Methods in Genomics | 3 |
| BIOS 7712 | Statistical Methods for Correlated Data | 1 |
| BIOS 7713 | Statistical Methods for Missing Data | 1-2 |

| | | |
|-----------------------------------------------------|--------------------------------------------------|-----------|
| BIOS 7714 | Advanced Statistical Computing | 3 |
| BIOS 7715 | Stochastic Modeling | 2 |
| BIOS 7717 | Bayesian Biostatistical Methods | 3 |
| BIOS 7718 | Introduction to Biomedical Image Analysis | 3 |
| BIOS 7719 | Information Visualization | 3 |
| BIOS 7720 | Applied Functional Data Analysis | 2 |
| BIOS 7721 | Joint Modeling of Longitudinal and Survival Data | 1 |
| Elective Health Sciences Courses (3 credits) | | 3 |
| Dissertation (30 credits) | | |
| BIOS 8990 | Doctoral Thesis | 1-10 |
| Total Hours | | 80 |