BIOSTATISTICS, MS

Banner Code: VS-MS-BSTA

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The MS in Biostatistics will allow students to specialize in the design and analysis of health-related and biological studies, while maintaining the rigor and technical training of the Statistical Science master's program.

In this degree, students will take a statistics core and a "bio" core, involving courses in public health, biology, and clinical medicine (including ethics). It also involves a research core which allows students to solve real data problems in the biological or health area and collaborate with other scientists in an interdisciplinary team. Finally, students will choose from electives in bioinformatics, global and community health, or targeted statistics courses.

This graduate degree prepares students for analyzing difficult data specific to biology and health. The program, with its research core, will also be sufficiently rigorous for students who wish to pursue a PhD in Biostatistics.

Admissions & Policies

Admissions

In addition to satisfying general admission requirements for graduate study, all applicants are expected to have basic computer literacy. They also must hold a bachelor's degree from an accredited institution in a field that includes coursework in multivariable calculus, matrix or linear algebra, statistics, and calculus-based probability. Applicants with degrees in such fields as mathematics, statistics, and some engineering programs usually meet these requirements. For applicants with degrees in other fields, these requirements are normally satisfied if students have successfully completed courses equivalent to the listed Mason courses.

Note that coursework taken to correct deficiencies in undergraduate preparation is not counted toward the degree.

Code	Title	Credits
MATH 113	Analytic Geometry and Calculus I (Mason Core) (http://catalog.gmu.edu/mason-core/)	4
MATH 114	Analytic Geometry and Calculus II	4
MATH 213	Analytic Geometry and Calculus III	3
MATH 203	Linear Algebra	3
or MATH 321	Abstract Algebra	
STAT 250	Introductory Statistics I (Mason Core) (http://catalog.gmu.edu/mason-core/)	3
or STAT 344	Probability and Statistics for Engineers and Scientists I	
STAT 346	Probability for Engineers	3
or MATH 351	Probability	

Specific application deadlines and requirements (https://admissions.gmu.edu/grad/application-deadlines-and-requirements/?academicUnit=VS&_ga=1.107632321.273102085.1480697294/) are available through the Office of Graduate Admissions.

Requirements

Degree Requirements

Total credits: 30

In addition to meeting general requirements that apply to master's degrees at Mason, all students must complete the 21-credit core requirements for the degree. A grade of "B-" or better is required in all 500-level statistics core courses. Students build on these core requirements by choosing 9 credits of electives.

Core Courses

Statistics Core
The Statistics core provides the basic probability, statistical analysis techniques, and statistical modeling tools that all biostatisticians must know, and provides a basis for higher level elective coursework.

Code	Title	Credits
STAT 544	Applied Probability	3
STAT 554	Applied Statistics I	3
STAT 654	Applied Statistics II	3
Total Credits		9

Bio Core
The Bio core is designed to provide the biological background necessary for biostatisticians. These courses offer preparation in the areas of public health and epidemiology (GCH 712 Introduction to Epidemiology), bioengineering (BENG 501 Bioengineering Research Methods , BENG 538 Medical Imaging) as well as bioinformatics (BINF 630 Bioinformatics Methods). In addition, this portion of the core curriculum ensures that students are trained in the statistical techniques required for clinical medicine, and includes material on ethics in research (STAT 560 Biostatistical Methods).

Code	Title	Credits
GCH 712	Introduction to Epidemiology	3
or BENG 501	Bioengineering Research Methods	
BINF 630	Bioinformatics Methods	3
or BENG 538	Medical Imaging	
STAT 560	Biostatistical Methods	3
Total Credits		9

Research Core
The Research core has been designed to assist students in the development of the requisite skills for careers in consulting or research. These courses will allow students to consult directly with biologists and medical and public health scientists on real data problems and provide opportunities to write reports and give oral presentations.

Code	Title	Credits
STAT 634	Case Studies in Data Analysis	3
or STAT 798	Master's Research Project	
Total Credits		3

Electives

The electives labeled STAT are specifically chosen from the department's master's-level electives to include techniques that are particularly important for biostatisticians.

Code	Title	Credits
Select three electives from the following:		9
GCH 782	International Research Ethics and Methods	
GCH 806	Advanced Multivariate Statistics and Data Analysis for Health Care Research	
STAT 652	Statistical Inference	
STAT 657	Nonparametric Statistics	
STAT 662	Multivariate Statistical Methods	
STAT 663	Statistical Graphics and Data Exploration I	
STAT 665	Categorical Data Analysis	
STAT 668	Survival Analysis	
STAT 672	Statistical Learning and Data Analytics	
STAT 760	Advanced Biostatistical Methods	
STAT 773	Statistical Methods for Longitudinal Data Analysis	
BENG 525	Neural Engineering	
BENG 537	Medical Image Processing	
BENG 541	Biomaterials	
BENG 550	Advanced Biomechanics	
Total Credits		9

Accelerated Master's

Bioengineering, BS/Biostatistics, Accelerated MS

Overview:

Highly-qualified students in Bioengineering, BS (http://catalog.gmu.edu/colleges-schools/engineering/bioengineering/bioengineering-bs/) have the option of obtaining an accelerated Biostatistics, MS. Students in an accelerated degree program must fulfill all university requirements for the master's degree.

For more detailed information, see AP.6.7 Bachelor's/Accelerated Master's Degrees (https://catalog.gmu.edu/policies/academic/graduate-policies/#ap-6-7). For policies governing all graduate degrees, see AP.6 Graduate Policies (https://catalog.gmu.edu/policies/academic/graduate-policies/).

Admission Requirements:

Students enrolled in a BS degree in Bioengineering (http://catalog.gmu.edu/colleges-schools/engineering/bioengineering/bioengineering-bs/) may apply to this option if they have earned 90 undergraduate credits with an overall GPA of 3.00. Students must have successfully completed MATH 213 Analytic Geometry and Calculus III and BENG 320 Bioengineering Signals and Systems. Criteria for admission are identical to criteria for admission to the Biostatistics, MS program

Accelerated Option Requirements:

Students must complete all requirements for the BS and MS programs, with 6 credits overlap.

Students register for the following 500-level courses, which will also count towards the technical elective requirements of their undergraduate degree:

Code	Title	Credits
BENG 501	Bioengineering Research Methods	3
STAT 554	Applied Statistics I	3

Note:

Students are permitted to take additional graduate basic courses in their undergraduate programs. In such cases, those classes cannot be counted toward requirements for the MS.

Degree Conferral:

Students must apply the semester before they expect to complete the BS requirements to have the BS degree conferred. In addition, at the beginning of the student's final undergraduate semester, students must complete a Bachelor's/Accelerated Master's Transition form (https://registrar.gmu.edu/forms/) that is submitted to the Office of the University Registrar and the VSE Graduate Admissions Office. At the completion of MS requirements, a master's degree is conferred.

Statistics, BS/Biostatistics, Accelerated MS

Overview:

Highly-qualified students in Statistics, BS (http://catalog.gmu.edu/colleges-schools/engineering/statistics/statistics-bs/) have the option of obtaining an accelerated Biostatistics, MS. Students in an accelerated degree program must fulfill all university requirements for the master's degree.
For more detailed information, see AP.6.7 Bachelor's/Accelerated Master's Degrees (https://catalog.gmu.edu/policies/academic/graduate-policies/#ap-6-7). For policies governing all graduate degrees, see AP.6 Graduate Policies (https://catalog.gmu.edu/policies/academic/graduate-policies/).

Admission Requirements:

Students enrolled in a BS degree in Statistics may apply to this option if they have earned 90 undergraduate credits with an overall GPA of 3.00.

Accelerated Option Requirements:

Students must complete all requirements for the BS and MS programs, with 6 credits overlap.

Students must complete all credits that satisfy requirements for the BS and MS programs, with 6 credits overlapping with grades of B or better in two 500-level STAT selected from STAT 544 (https://catalog.gmu.edu/search/?P=STAT%20544/) Applied Probability, STAT 554 (https://catalog.gmu.edu/search/?P=STAT%20554/) Applied Statistics I, and STAT 560, Biostatical methods.

Degree Conferral:

Students must apply the semester before they expect to complete the BS requirements to have the BS degree conferred. In addition, at the beginning of the student's final undergraduate semester, students must complete a Bachelor's/Accelerated Master's Transition form that is submitted to the Office of the University Registrar and Graduate Recruitment and Enrollment Services. At the completion of MS requirements, a master's degree is conferred.