

STATISTICS, B.S.

2017 - 2018

The Bachelor of Science in Statistics is designed to provide a framework for students to develop connections between statistical concepts and theories and their applications to statistical practice. It will prepare statisticians who can use modern statistical techniques to design studies, collect data, analyze and visualize high dimensional data sets, and draw valid conclusions in an increasingly data-centric world. In this program, students will meld the time-tested concepts and theories of statistics with modern methods of analysis, in order to interpret the data that is collected in nearly every discipline and every sector of industry and government.

Graduates of this program can look forward to careers in local, state, and federal government, and in the many industries that conduct scientific research, collect, and analyze data. They will enter the workforce with the ability to impact science, public policy, technology, and industry in a positive way through their expertise in data collection, analysis, synthesis, and interpretation, each with the highest ethical standards. Graduates will also be well prepared to continue their studies in graduate schools if they so desire.

Admission Requirements

Admission to George Mason is competitive. Each candidate who presents sufficient admission qualifications is reviewed in the context of other qualified applicants. An offer of admission is valid only for the semester for which the student applied. Application for undergraduate admission should be made to the Office of Admissions. Please consult <http://admissions.gmu.edu> for additional information.

Freshman Admission Requirements

The following factors are considered when reviewing applications for admission:

- Cumulative high school grade point average for course work completed in grades 9 through 12.
- Level of difficulty of course work elected throughout the high school years, particularly in English, mathematics, laboratory science, social science, and foreign language.
- Scores from Scholastic Aptitude Test I (SAT I) or the American College Test (ACT).
- Test of English as a Foreign Language (TOEFL) where applicable.
- Essays, list of extracurricular activities, and teacher and guidance counselor recommendations.

Transfer Admission Requirements

The university accepts qualified students who wish to transfer from other colleges. Transfer applicants must submit official transcripts from each collegiate institution attended. Transfer applicants with fewer than 30 semester hours of transferable credit must also submit a copy of their secondary school record and test scores. All non-native English speakers are also required to submit a TOEFL or IELTS score or acceptable grades (C or better) in at least two English composition or literature classes taken at another U.S. university or college.

Undecided Students

Students who are undecided but interested in pursuing a major in Statistics should seek the advice of the VSE advising coordinator. Sample schedules of the majors within the Volgenau School of Engineering are also available from each individual department.

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Change of Major

Students considering changing their major to Statistics should consult with the Volgenau School of Engineering Coordinator of Undergraduate Advising, 2500 Nguyen Engineering Building. These students must have a cumulative GPA of at least 2.75 and completed MATH 114 with a grade of C or better.

Advanced Placement, Credit by Exam

A score of 5 on the Advanced Placement (AP) statistics exam qualifies students for credit in STAT 260.

Degree Requirements

The Statistics, B.S., degree program can be successfully completed in 8 full-time semesters with an average of 15 credits each semester, as shown in the sample schedules. Within this degree program, there are “cores” in specific topic areas essential to statistics. Specifically, the Mathematics Core courses provide a basic foundation in mathematics which is required for understanding why and when statistical methods work. The Computational Skills Core courses provide fundamental computing skills essential to working with data, such as the ability to access and manipulate data in various ways, perform algorithmic problem-solving, and use simulation-based statistical techniques. Finally, the Statistics Core courses provide foundational statistical knowledge and synthesis of concepts acquired in the student’s undergraduate coursework in statistics and data analytics. Through the Statistics Core courses, student learn to design studies, use graphical and other means to explore data, build and assess statistical models, employ a variety of formal inference procedures, and draw appropriate conclusions from the analysis.

The Restricted Statistics Elective and the Restricted Technical Elective courses, which are an integral part of the curriculum, allow students to target their more advanced training in statistical applications, mathematics, and computational skills to their specific interests and anticipated future employment. Selection of specific elective courses also provides added opportunities for research in addition to the capstone experience which is part of the Statistics Core coursework.

Selection of a concentration allows a student to specialize in applied, theoretical, or computational aspects of statistical practice. Students will select one of three concentrations: Applied Statistics, Mathematical Statistics, or Statistical Analytics.

As a culminating experience, each student will complete a capstone course requiring application of coursework to a real-world problem. The capstone experience will provide synthesis of methods and concepts acquired in the student’s undergraduate coursework in statistics and data analytics, as well as opportunities for research. Part of the capstone experience will involve students working in small groups on a project and presenting their findings in a written report and an oral presentation; this experience will strengthen the student’s skills in the areas of technical writing and oral communication. Students will develop the tools necessary to conduct effective consulting sessions, work collaboratively to solve problems, and utilize professional publications in statistics. Also, students will develop an understanding of professional ethics and a historical perspective of the field of statistics.

Program Questions? Email: statistics@gmu.edu

Website: statistics.gmu.edu

Fairfax Campus: Nguyen Engineering Building, Rm.1705

4400 University Dr., Fairfax, VA 22030, MSN 4A7

Phone (703) 993-3645; Fax (703) 993-1700

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Concentration Area

Students choose one of three concentrations from the list below.

Applied Statistics

Focuses on developing proficiency in analytical methods applicable to a specific discipline of the student's choosing. This is accomplished through the requirement to complete a minor in a field that makes substantial use of data analysis.

Students must complete 15 - 21 credits in a pre-approved minor, selected in consultation with the undergraduate coordinator. Courses taken to fulfill the minor requirements that are not used to fulfill Major Core or Restricted Electives requirements are considered unique to the minor. At least 15 credits of the minor coursework, technical electives, general electives, and additional Mason Core courses must be at or above the 300 level.

Mathematical Statistics

Designed for students interested in mastering the theoretical underpinnings of statistics and probability; this concentration is recommended for students who intend to continue graduate studies in statistics or whose main focus is on research.

Statistical Analytics

Blends the disciplines of computer science and statistics in a very modern way and is designed for students interested in applying concepts from statistics and computer science to the analysis of massive data sets.

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2017-2018 Sample Schedule for Undergraduate Statistics major – Applied Statistics Concentration (w/ 18 credit minor)

First Semester	Credits	Second Semester	Credits
STAT 260 Introduction to Statistical Practice	3	STAT 362 Intro to Computer Statistical Packages	3
MATH 113 Analytic Geometry and Calculus I	4	MATH 114 Analytic Geometry and Calculus II	4
CS 105 Computer Ethics and Society	1	CS 112 Introduction to Computer Programming	4
Mason Core*	3	Mason Core*	3
Mason Core*	3		
Total Hours	14	Total Hours	14
 Third Semester		 Fourth Semester	
STAT 334 Intro to Probability Models Simulation	3	STAT 354 Prob & Stats for Engineers & Sci II	3
MATH 203 Linear Algebra	3	Minor Requirement	3
Minor Requirement	3	Technical Elective	3
Mason Core*	3	Mason Core*	3
General Elective	4	Mason Core*	4
Total Hours	16	Total Hours	16
 Fifth Semester		 Sixth Semester	
STAT 456 Applied Regression Analysis	3	STAT 463 Introduction to Exploratory Data Analysis	3
Statistics Elective	3	Statistics Elective	3
Minor Requirement	3	Minor Requirement	3
Mason Core*	3	ENGH 302 Adv Comp (Natural Science section)***	3
Mason Core*	3	Mason Core*	3
Total Hours	15	Total Hours	15
 Seventh Semester		 Eighth Semester	
STAT 489 Pre-Capstone Pro Development	3	STAT 490 Capstone in Statistics	3
Statistics Elective	3	Minor Requirement	3
Minor Requirement	3	Technical Elective	3
Technical Elective	3	General Elective	3
General Electives	3	General Elective	3
Total Hours	15	Total Hours	15

* <http://catalog.gmu.edu/mason-core> Mason Core Categories: One course from each: Oral Communication, ENGH101, Arts, Global Understanding, Literature, Western Civilization/ World History, Social Behavioral Science, Natural Science w/ Lab, Natural Science Non-Lab. STAT students do not need to seek out Math, and IT categories as they are built into the major curriculum.

*** ENGH 101 and Mason Core-Literature must be completed before taking ENGH 302.

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2017-2018 Sample Schedule for Undergraduate Statistics major - **Mathematical Statistics Concentration**

First Semester	Credits	Second Semester	Credits
STAT 260 Introduction to Statistical Practice	3	STAT 362 Intro to Computer Statistical Packages	3
MATH 113 Analytic Geometry and Calculus I	4	MATH 114 Analytic Geometry and Calculus II	4
CS 105 Computer Ethics and Society	1	CS 112 Introduction to Computer Programming	4
Mason Core*	3	Mason Core*	3
Mason Core*	3		
Total Hours	14	Total Hours	14
Third Semester		Fourth Semester	
MATH 203 Linear Algebra	3	STAT 346 Probability for Engineers	3
MATH 213 Analytic Geometry and Calculus III	3	MATH 290 Introduction to Advanced Mathematics	3
CDS 130 Computing for Scientists	3	Technical Elective	3
Mason Core*	3	Mason Core*	3
Mason Core*	4	General Elective	4
Total Hours	16	Total Hours	16
Fifth Semester		Sixth Semester	
STAT 354 Prob & Stats for Engineers & Sci II	3	STAT 463 Introduction to Exploratory Data Analysis	3
STAT 356 Statistical Theory	3	MATH 315 Advanced Calculus I	3
Mason Core*	3	Statistics Elective	3
Mason Core*	3	ENGH 302 Adv Comp (Natural Science section)***	3
General Elective	3	Mason Core*	3
Total Hours	15	Total Hours	15
Seventh Semester		Eighth Semester	
STAT 489 Pre-Capstone Pro Development	3	STAT 490 Capstone in Statistics	3
STAT 456 Applied Regression Analysis	3	Statistics Elective	3
Statistics Elective	3	Technical Elective	3
Technical Elective	3	General Elective	3
General Elective	3	General Elective	3
Total Hours	15	Total Hours	15

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2017-2018 Sample Schedule for Undergraduate Statistics major – Statistical Analytics Concentration

First Semester	Credits	Second Semester	Credits
STAT 260 Introduction to Statistical Practice	3	STAT 362 Intro to Computer Statistical Packages	3
MATH 113 Analytic Geometry and Calculus I	4	MATH 114 Analytic Geometry and Calculus II	4
CS 105 Computer Ethics and Society	1	CS 112 Introduction to Computer Programming	4
Mason Core*	3	Mason Core*	3
Mason Core*	3		
Total Hours	14	Total Hours	14
Third Semester		Fourth Semester	
STAT 334 Intro to Probability Models Simulation	3	STAT 354 Prob & Stats for Engineers & Sci II	3
MATH 203 Linear Algebra	3	MATH 125 Discrete Mathematics	3
CS 211 Object-Oriented Programming	3	CS 310 Data Structures	3
Mason Core*	3	Technical Elective	3
General Elective	4	Mason Core*	3
Total Hours	16	Total Hours	15
Fifth Semester		Sixth Semester	
STAT 456 Applied Regression Analysis	3	STAT 463 Introduction to Exploratory Data Analysis	3
CS 330 Formal Methods and Models	3	STAT 472 Introduction to Statistical Learning	3
OR 481 Numerical Methods in Engineering	3	CS 450 Database Concepts	3
Statistics Elective	3	ENGH 302 Adv Comp (Natural Science section)***	3
General Elective	4	Mason Core*	3
Total Hours	16	Total Hours	15
Seventh Semester		Eighth Semester	
STAT 489 Pre-Capstone Pro Development	3	STAT 490 Capstone in Statistics	3
CS 484 Data Mining	3	Statistics Elective	3
Statistics Elective	3	Technical Elective	3
Technical Elective	3	General Elective	3
Mason Core*	3	Mason Core*	3
Total Hours	15	Total Hours	15

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