Volgenau School of Engineering - Statistics, BS				
	Catalog Year: 2019 - 2020		**Grades**	
Mason Core Requirements (31 credits)	**Course Information**	Credits	Earned	Needed
Written Communication:	ENGH 101 (100)	3		
Oral Communication	COMM 100 or 101	3		
*Quantitative Reasoning	*Satisfied by Major Requirements			
*Information Technology	*Satisfied by Major Requirements			
Arts		3		
Global Understanding		3		
Literature		3		
Natural Science with lab		4		
Natural Science Overview		3		
Social & Behavioral Science		3		
Western Civ/World History		3		
**Written Communication	ENGH 302 - **Natural Science Section Only	3		
*Capstone/Synthesis	*Satisfied by Major Requirements			
Major Requirements (73-79 credits)				
Statistics Core Requirements (58 credits)		Credits	Earned	Needed
STAT 260	Introduction to Statistical Practice I	3		
STAT 334 or STAT 346	Introduction to Probability Models & Simulation or Probability for Engineers	3		
STAT 354 or STAT 360	Probability and Statistics for Engineers and Scientists II or Introduction to Statistical Practice II	3		
STAT 362	Introduction to Computer Statistical Packages	3		
STAT 456	Applied Regression Analysis	3		
STAT 463	Introduction to Exploratory Data Analysis	3		
STAT 489	Pre-Capstone Professional Development	3		
STAT 490	Capstone in Statistics	3		
Statistics Electives (9 credits): Any STAT courses numbered 440-499		9		
Tehncial Elecdtives (9 credits): CDS course 100-399; CS coures above 200; MATH courses above 200; OR courses above 300; BENG 322; CYSE 101, 325; ENGH 388; IT 214; SOCI 391; SYST 438, 468, 473, 488		9		
Mathematics and Computer Skills Core (11 credits)				
MATH 113	Analytic Geometry and Calculus I	4		
MATH 114	Analytic Geometry and Calculus II	4		
MATH 203	Linear Algebra	3		
CS 105 or CDS 151	Computer Ethics and Society or Data Ethics in an Information Society	1		
CS 112	Introduction to Computer Programming (Mason Core)	4		
Concentration in Applied Statistics (15-21 credits): Students must complete a pre-approved minor.				
Concentration in Mathematical Statistics (15 credits)				
STAT 356	Statistical Theory	3		
CDS 130	Computing for Scientists (Mason Core)	3		
MATH 213	Analytic Geometry and Calculus III 1	3		
MATH 290	Introduction to Advanced Mathematics	3		
MATH 315	Advanced Calculus I	3		
Concentration in Statistical Analysis 24 credits)				
STAT 472	Introduction to Statistical Learning	3		
CS 211	Object-Oriented Programming	3		
CS 310	Data Structures	3		
CS 330	Formal Methods and Models	3		
CS 450 or CS 302	Database Concepts or Scientific Data and Databases	3		
CS 484 or CDS 303	Data Mining or Scientific Data Mining	3		
MATH 125	Discrete Mathematics I (Mason Core)	3		
OR 481	Numerical Methods in Engineering	3		
Degree Notes				
Approx 7-16 credits of elective courses to bring the degree total to 120 with 45 credits at the 300/400 level				

Volgenau School of Engineering

STATISTICS, B.S.

2019 - 2020

Statistics—the science of learning from data—is one of the basic scientific disciplines. It has been an important independent subject since the early 1900s. Careers in statistics are now among the fastest growing and top paying jobs in the country.

The BS in Statistics prepares statisticians who can meld modern methods of analysis with the time-tested concepts and theories of statistics to design studies, collect data, analyze and visualize high dimensional data sets, and draw valid conclusions in an increasingly data-centric world.

This thorough training will give our graduates the expertise to impact their chosen fields in a positive way while maintaining the highest ethical standards.

Degree Requirements

The Statistics, B.S., program can be completed in 8 full-time semesters with an average of 15 credits each semester. Within this program, there are "cores" in topic areas essential to statistics, specifically: Computational Skills, Mathematics and Statistics Core courses.

In addition to the core courses, students will select an area of concentration as detailed below and will take Restricted Statistics Electives and Restricted Technical Electives. This gives students the opportunity to take courses with a focus on their specific interests and anticipated future employment. Selection of specific elective courses also provides opportunities for research and internships.

As a culminating experience, each student will complete a capstone course, which will synthesize concepts and methods learned over the course of the student's undergraduate career and grant opportunities to conduct research focused on real-world problems. The capstone experience strengthens the student's skills in areas such as technical writing and oral communication by having students work with small groups on a project and then present their findings in a written report and an oral presentation. Students will develop the tools necessary to conduct effective consulting sessions, work collaboratively to solve problems, and utilize professional publications in statistics.

Concentration Areas

- ***Statistical Analytics***
  Blends the disciplines of computer science and statistics and is designed for students interested in applying concepts from these fields to the analysis of massive data sets, i.e. working with "big data." This concentration may facilitate entry into our *Accelerated MS Data Analytics Engineering*.

- ***Applied Statistics***
  Develops proficiency in statistical techniques applicable to a specific discipline, e.g. biology, criminology, economics, psychology, sports analytics, and many more. Incorporates a student-selected, department-approved minor in any field that makes use of data analysis. This concentration may facilitate entry into Accelerated Master's programs at Mason.

- ***Mathematical Statistics***
  Develops knowledge in theoretical underpinnings of statistics and probability; ideal for students interested in research or who intend to continue on to graduate studies. This concentration may facilitate entry into our *Accelerated MS Statistical Science or Biostatistics*.

STATISTICS, BS

2019-2020 Sample Schedule for Undergraduate Statistics major – Statistical Analytics Concentration

First Semester	Credit	Second Semester	Credits	Third Semester	Credits	Fourth Semester	Credits
STAT 260 Intro to Stat Practice	3	STAT 362 Intro to Comp Stat. Pack	3	STAT 334 Intro to Prob. Mod & Sim	3	STAT 354 Probability & Stat or STAT 360 Intro to Stat Practice II	3
MATH 113 Analy Geom & Calc I	4	MATH 114 Analyt Geo & Calc II	4	MATH 203 Linear Algebra	3	MATH 125 Discrete Math,	3
CS 105 Comp Ethics & Society	1	CS 112 Intro to Comp. Prog.	4	CS 211 Object-Oriented Prog.	3	CS 310 Data Structures	3
Mason Core*	3	Mason Core*	3	Mason Core*	3	Technical Elective	3
Mason Core*	3			Mason Core*	4	Mason Core*	3
Total Hours	**14**	**Total Hours**	**14**	**Total Hours**	**16**	**Total Hours**	**15**
Fifth Semester	**Credits**	**Sixth Semester**	**Credits**	**Seventh Semester**	**Credits**	**Eighth Semester**	**Credits**
STAT 456 App Regr Analysis	3	STAT 463 Intro to Expl Data Analy	3	STAT 489 Pre-Capstone	3	STAT 490 Capstone in Stat	3
CS 330 Formal Meth. and Mod.	3	STAT 472 Intro to Stat. Learning	3	CS 484 Data Mining	3	Statistics Elective	3
OR 481 Num. Methods in Engin.	3	CS 450 Database Concepts	3	Statistics Elective	3	Technical Elective	3
Statistics Elective	3	ENGH 302 Adv Comp (Nat. Sci)***	3	Technical Elective	3	General Elective	3
General Elective	4	Mason Core*	3	Mason Core*	3	Mason Core*	3
Total Hours	**16**	**Total Hours**	**15**	**Total Hours**	**15**	**Total Hours**	**15**

2019-2020 Sample Schedule for Undergraduate Statistics major – Applied Statistics Concentration (assuming 18 credit minor)

First Semester	Credits	Second Semester	Credits	Third Semester	Credits	Fourth Semester	Credits
STAT 260 Intro to Stat Practice	3	STAT 362 Intro to Com Stat Pack	3	STAT 334 Intro to Prob Mod & Sim	3	STAT 354 Prob. and Stat or STAT 360 Intro to Stat Practice II	3
MATH 113 Analyt Geo & Calc I	4	MATH 114 Analyt Geo and Calc II	4	MATH 203 Linear Algebra	3	Minor Requirement	3
CS 105 Comp Ethics and Society	1	CS 112 Intro to Comp Programing	4	Minor Requirement	3	Technical Elective	3
Mason Core*	3	Mason Core*	3	Mason Core*	3	Mason Core*	3
Mason Core*	3			General Elective	4	Mason Core*	4
Total Hours	**14**	**Total Hours**	**14**	**Total Hours**	**16**	**Total Hours**	**16**
Fifth Semester	**Credits**	**Sixth Semester**	**Credits**	**Seventh Semester**	**Credits**	**Eighth Semester**	**Credits**
STAT 456 App Regr Analysis	3	STAT 463 Intro to Expl Data Analy	3	STAT 489 Pre-Cap Prof Develop.	3	STAT 490 Capstone in Stat.	3
Statistics Elective	3	Statistics Elective	3	Statistics Elective	3	Minor Requirement	3
Minor Requirement	3	Minor Requirement	3	Minor Requirement	3	Technical Elective	3
Mason Core*	3	ENGH 302 Adv Comp (Nat Sci)***	3	Technical Elective	3	General Elective	3
Mason Core*	3	Mason Core*	3	General Elective	3	General Elective	3
Total Hours	**15**	**Total Hours**	**15**	**Total Hours**	**15**	**Total Hours**	**15**

2019-2020 Sample Schedule for Undergraduate Statistics major - Mathematical Statistics Concentration

First Semester	Credits	Second Semester	Credits	Third Semester	Credits	Fourth Semester	Credits
STAT 260 Intro to Stat. Practice	3	STAT 362 Intro to Comp. Stat Pack	3	MATH 203 Linear Algebra	3	STAT 346 Prob. for Engin.	3
MATH 113 Analyt Geo and Calc I	4	MATH 114 Analyt Geo and Calc II	4	MATH 213 Analyt Geo and Calc III	3	MATH 290 Intro Adv Math	3
CS 105 Comp. Ethics and Society	1	CS 112 Intro to Comp Programing	4	CDS 130 Computing for Scientists	3	Technical Elective	3
Mason Core*	3	Mason Core*	3	Mason Core*	3	General Elective	4
Mason Core*	3			Mason Core*	4	Mason Core*	3
Total Hours	**14**	**Total Hours**	**14**	**Total Hours**	**16**	**Total Hours**	**16**
Fifth Semester	**Credits**	**Sixth Semester**	**Credits**	**Seventh Semester**	**Credits**	**Eighth Semester**	**Credits**
STAT 354 Prob and Stat or STAT 360 Intro to Stat Practice II	3	STAT 463 Intro to Exp Data Analy	3	STAT 489 Pre-Cap Prof Develop	3	STAT 490 Capstone in Stat	3
STAT 356 Statistical Theory	3	MATH 315 Advanced Calculus I	3	STAT 456 Applied Reg Analysis	3	Statistics Elective	3
Mason Core*	3	Statistics Elective	3	Statistics Elective	3	Technical Elective	3
Mason Core*	3	ENGH 302 Adv Comp (Nat Sci)***	3	Technical Elective	3	General Elective	3
General Elective	3	Mason Core*	3	General Elective	3	General Elective	3
Total Hours	**15**	**Total Hours**	**15**	**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. VSE students do not need to seek out IT and Quantitative Reasoning categories as they are built into the major curriculum. *** ENGH 101 and Mason Core-Literature must be completed before taking ENGH 302.

Program Questions? Email: statistics@gmu.edu
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