College of SCIENCE
Department of STATISTICS
Bachelor of Science in STATISTICS
Major in Statistics
For student date of entry under UG catalog 2021-2022

A dagger (†) indicates a course with prerequisites or co-requisites.

I. Pathways General Education (47 credits)

Concept 1 Discourse (9 credits)

(1f): 6 credits in foundational courses. ENGL 1105-1106 required

ENGL 1105	3		† ENGL 1106	3	

(1a): 3 credits in advanced or applied writing or speaking courses. ENGL 3764 is required

† ENGL 3764	3	

Concept 2 Critical Thinking in Humanities (6 credits)

	3			3	

Concept 3 Reasoning in the Social Sciences (6 credits)

	3			3	

Concept 4 Reasoning in the Natural Sciences (6 credits)

	3			3	

Concept 5 Quantitative and Computational Thinking (11 Credits)

(5f): 6 credits in foundational courses. The following course sequence is required of all students majoring in Statistics.

† MATH 1225^1-1226^1 Calculus of a Single Variable	4			4	

(5a): 3 credits in advanced or applied courses. The following course is required of all students majoring in Statistics.

† STAT 3005 Statistical Methods	3	

Concept 6 Critique and Practice in Design and the Arts (6 credits = 3 in design + 3 in arts, or 6 in integrated design and arts)

	3			3	

Concept 7 Critical Analysis of Identity and Equity in the United States (3 credits)

	3	

II.	**Statistics Bachelor of Science Degree Core Requirements (42 credits)**

STAT Required Courses. Complete all the following courses (33 credits)

† STAT 3006 Statistical Methods	3
† STAT 3104 Probability and Distributions	3
† STAT/CMDA/CS 3654 Introductory Data Analytics and Visualization	3
† STAT 4004 Methods Statistical Computing	3
† STAT 4024 Communication in Statistics	3
† STAT 4105 Theoretical Statistics	3
† STAT 4106 Theoretical Statistics	3
† STAT 4204 Experimental Designs	3
† STAT 4214 Methods of Regression Analysis	3
† STAT 4444 Applied Bayesian Statistics	3
† STAT 4584 Advanced Calculus for Statistics OR †MATH 3224 Advanced Calculus	3

*All students completing a B.S. in Statistics must complete STAT 3005 Statistical Methods. This requirement is included in Section I above.

Mathematics Required Courses. Complete all the following courses (6 credits)

† MATH 2204 Intro Multivariable Calculus	3
† MATH 2114 Introduction to Linear Algebra	3

**All students completing a B.S. in Statistics must complete MATH 1225-1226. These courses are listed in Section I above.

Computer Science Required Courses. Complete ONE of the following courses (3 credits)

CS 1064² Introduction to Programming in Python	3
CS 1114 Introduction to Software Design	3

III.	**Restricted Electives (9 credits)**

Complete THREE courses from the following list. At least ONE of the three must be STAT.

† STAT 3094 SAS Programming	3
† STAT 3504 Nonparametric Statistics	3
† STAT 4364 Introduction to Statistical Genomics	3
† STAT 4504 Applied Multivariate Analysis	3
† STAT 4514 Contingency Table Analysis	3
† STAT 4524 Sample Survey Methods	3
† STAT 4534 Applied Time Series	3

† STAT/CMDA/CS 4654 Intermediate Data Analytics and Machine Learning	3	
† STAT/CMDA 4664 Computational Intensive Stochastic Modeling	3	
† STAT 4804[3] Elementary Econometrics	3	
† STAT 4964[4] Field Study or STAT 4994[4] Undergraduate Research	3	
† BIT 3424[5,7] Introduction to Business Analytics Modeling	3	
† BIT 3434[5,7] Advanced Modeling for Business Analytics	3	
† BIT 4544 Advanced Methods in Business Analytics	3	
† CS 4234[5] Parallel Computation	3	
† ECE 4424 (CS 4824) Machine Learning	3	
† MATH 3054[5] Programming for Math	3	
† MATH 4454[5] Applied Mathematical Modeling	3	
† MATH 4225[5] Elementary Real Analysis	3	
† ISE 4404[5] Statistical Quality Control	3	
† GEOG 4314[5] Analysis in GIS	3	
GEOG/GEOS 4354[5] Introduction to Remote Sensing	3	

IV.   Free Electives (22 credits)

Prerequisites

† Some courses listed on this checksheet may have prerequisites; please consult the Undergraduate Course Catalog or check with your advisor for more information.

Foreign Language Requirement

Students who did not successfully complete at least two years of a single foreign, classical, or sign language during high school must successfully complete six semester hours of a single foreign, classical, or sign language at the college level. Courses taken to meet this requirement do not count toward the hours required for graduation. Please consult the Undergraduate Catalog for details.

Course Substitutions and Comments

[1]The sequence MATH 1225-1226 is equivalent to taking all of the following: MATH 1205 **AND** MATH 1206 **AND** MATH 1124.

[2]For transfer students from Computer Science, CS 1705 may substitute for CS 1064.

[3]For Economic majors or minors, ECON 4304, Introduction to Econometric Methods, can substitute for STAT 4804.

[4]A maximum of 3 credits from either 4964, Field Study (for internships or other summer experience), or STAT 4994, Undergraduate Research, may count as a Statistic elective with prior approval from the department.

[5]An upper-level course that is not offered by the Department of Statistics. Be aware of *all* prerequisites.

[6]CMDA 2005-2006 is equivalent to all the following: STAT 3005 **AND** STAT 3006 **AND** STAT 3104 **AND** MATH 2214 **AND** (MATH 2204 OR MATH 2204H OR MATH 2224 OR MATH 2224H OR MATH 2406H)

[7]Be aware that priority enrollment is given to BIT majors.

Satisfactory Progress Towards Degree and Minimum Grade Requirements

- Within the first two attempts, including attempts ending in course withdrawal, students must earn a C- or better in all MATH, STAT, or CS designated courses for the degree (or equivalents thereof).
- It is recommended that, upon attempting 72 credit hours, students will have completed STAT 3005, MATH 1225, 1226, 2114, 2204, and CS 1064 or 1114.
- Upon having attempted 90 semester credits, students must have an in-major GPA of 2.0 or better.

Graduation Requirements

Virginia Tech requires **120** credit hours to graduate with a GPA of 2.0 or greater for all hours attempted. The 120 credit hours must include all required courses for the statistic major as outlined in this check-sheet. In addition, students must have an in-major GPA of 2.0 or greater. For purposes of GPA computation, courses IN-MAJOR will include Core requirements, Major requirements, Restricted Electives, BIOL 1105, 1106, 1115, 1116, and MATH 1025-1026. If 120 credit hours are reached and a student does not meet the GPA requirement, the student must take additional in-major courses to raise the in-major GPA to a 2.0.