

STATISTICS MAJORS WITH STATISTICAL DATA SCIENCE OPTION

Program Curriculum

| Code | Title | Credits |
|---|--|---------|
| Degree Core Requirements | | |
| STAT 3006 | Statistical Methods | 3 |
| STAT 3104 | Probability and Distributions | 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 |
| Subtotal | | 21 |
| Major Requirements | | |
| STAT 3654 | Introductory Data Analytics and Visualization | 3 |
| STAT 4004 | Methods of Statistical Computing | 3 |
| STAT 4024 | Communication in Statistical Collaborations | 3 |
| MATH 2204 | Introduction to Multivariable Calculus | 3 |
| MATH 2114 | Introduction to Linear Algebra | 3 |
| Select one of the following: | | 3 |
| CS 1064 | Introduction to Programming in Python | |
| CS 1114 | Introduction to Software Design | |
| Subtotal | | 18 |
| Option Required Courses | | |
| STAT 4654 | Intermediate Data Analytics and Machine Learning | 3 |
| Select two of the following: ⁴ | | 6 |
| CS 1064 | Introduction to Programming in Python | |
| CS 1114 | Introduction to Software Design | |
| CS 2064 | Intermediate Programming in Python | |
| CS 2114 | Software Design and Data Structures | |
| MATH 3054 | Programming for Mathematical Problem Solving ⁴ | |
| STAT 3094 | SAS Programming | |
| Restricted Electives | | |
| Select four of the following (at least two must be STAT) | | 12 |
| STAT 3204 | Data Visualization | |
| STAT 3504 | Nonparametric Statistics | |
| STAT 4364 | Introduction to Statistical Genomics | |
| STAT 4504 | Applied Multivariate Analysis | |
| STAT 4514 | Introduction to Categorical Data Analysis | |
| STAT 4524 | Sample Survey Methods | |
| STAT 4534 | Applied Statistical Time Series Analysis | |
| STAT 4584 | Advanced Calculus for Statistics | |
| or MATH 322 | Advanced Calculus | |
| STAT 4664 | Computational Intensive Stochastic Modeling | |
| STAT 4804 | Elementary Econometrics ¹ | |
| STAT 4964 | Field Study ² | |
| or STAT 4994 | Undergraduate Research | |
| BIT 3424 | Introduction to Business Analytics Modeling ^{3,5} | |

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|---|---|------------|
| BIT 3434 | Advanced Modeling for Business Analytics ^{3,5} | |
| BIT 4544 | Advanced Methods in Business Analytics ^{3,5} | |
| CS 4234 | Parallel Computation ³ | |
| ECE 4424 | Machine Learning ³ | |
| MATH 4454 | Applied Mathematical Modeling ³ | |
| ISE 4404 | Statistical Quality Control ³ | |
| GEOG 4314 | Spatial Analysis in Geographic Information Systems ³ | |
| GEOG 4354 | Introduction to Remote Sensing ³ | |
| Subtotal | | 21 |
| Free Electives | | |
| Select remaining credits required for the degree: | | 13 |
| Subtotal | | 13 |
| Pathways to General Education | | |
| <i>Pathways Concept 1 - Discourse</i> | | |
| ENGL 1105 | First-Year Writing (1F) | 3 |
| ENGL 1106 | First-Year Writing (1F) | 3 |
| ENGL 3764 | Technical Writing (1F) | 3 |
| <i>Pathways Concept 2 - Critical Thinking in the Humanities</i> | | |
| Select six credits in Pathway 2 (https://catalog.vt.edu/course-search/?attrs_pathways=attrs_pathways_G02) | | 6 |
| <i>Pathways Concept 3 - Reasoning in the Social Sciences</i> | | |
| Select six credits in Pathway 3 (https://catalog.vt.edu/course-search/?attrs_pathways=attrs_pathways_G03) | | 6 |
| <i>Pathways Concept 4 - Reasoning in the Natural Sciences</i> | | |
| Select six credits in Pathway 4 (https://catalog.vt.edu/course-search/?attrs_pathways=attrs_pathways_G04) | | 6 |
| <i>Pathways Concept 5 - Quantitative and Computational Thinking</i> | | |
| MATH 1225 | Calculus of a Single Variable | 8 |
| & MATH 1226 | and Calculus of a Single Variable (required of all students majoring in Statistics; 5F) | |
| STAT 3005 | Statistical Methods (required of all students majoring in Statistics; 5F) | 3 |
| <i>Pathways Concept 6 - Critique and Practice in Design and the Arts</i> | | |
| Select 6 credits = 3 in design + 3 in arts, or 6 in integrated design and arts) | | 6 |
| <i>Pathways Concept 7 - Critical Analysis of Identity and Equity in the United States</i> | | |
| Select three credits in Pathway 7 (https://catalog.vt.edu/course-search/?attrs_pathways=attrs_pathways_G07) | | 3 |
| Subtotal | | 47 |
| Total Credits | | 120 |

¹ For Economic majors or minors, ECON 4304 Introduction to Econometric Methods can substitute for STAT 4804 Elementary Econometrics.

² A maximum of 3 credits from either STAT 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.

³ An upper-level course that is not offered by the Department of Statistics. Be aware of *all* prerequisites.

⁴ These courses must be different from the course completed in the major requirements section.

⁵ Be aware that priority enrollment is given to BIT majors.

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, and restricted electives. 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.

All students completing a B.S. in Statistics must complete MATH 1225 Calculus of a Single Variable-MATH 1226 Calculus of a Single Variable and STAT 3005 Statistical Methods. These courses are listed in Pathways to General Education above.

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

CMDA 2005 Integrated Quantitative Sciences-CMDA 2006 Integrated Quantitative Sciences is equivalent to all the following: STAT 3005 Statistical Methods **and** STAT 3006 Statistical Methods **and** STAT 3104 Probability and Distributions **and** MATH 2214 Introduction to Differential Equations **and** (MATH 2204 Introduction to Multivariable Calculus **or** MATH 2204H Introduction to Multivariable Calculus **or** MATH 2406H Mathematics in a Computational Context

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 Statistical Methods, MATH 1225 Calculus of a Single Variable, MATH 1226 Calculus of a Single Variable, MATH 2114 Introduction to Linear Algebra, MATH 2204 Introduction to Multivariable Calculus, and CS 1064 Introduction to Programming in Python or CS 1114 Introduction to Software Design.
- Upon having attempted 90 semester credits, students must have an in-major GPA of 2.00 or better.