BS Data Science + MS Statistics FAST Program

Note: There are no concentrations in the BS Data Science degree, and 4 concentrations in the MS Statistics degree plus a no concentration option. The FAST program supports all 5 master's degree options.

Total FAST Program Units (BS + MS) 120+22 = 142

Data Science, B.S. Program (120 units)

Degree Requirements Unit-Outline

A baccalaureate of arts degree requires a total of 120 units:

- **The major requirements consist of 58 units**
- **General Education (GE) & Graduation Requirements (GR) consist of 52 units;**
- **Free Electives may consist of 10 units (actual number of free elective units may depend on GE/GR units).**

Note: It may be possible to double-count units within the graduation requirements or a course may satisfy both a graduation requirement and a major requirement. Students should contact their program advisors for information.

Data Science Major Requirements (58 units)

Please consult an advisor in the department for clarification and interpretation of the major requirements.

Introductory Core (13 units)

Take the following Lower-division requirements for 13 units:

- **CS 100 - Programming for Everyone** ***Units: 3***
- **DATA 105 - Math for Data Science 1** ***Units: 5 ; Breadth Area: GE-2***
- **DATA 130 - Data Science Profession** ***Units: 2***
- **STAT 215 - Introduction to Data Science** ***Units: 3***

Advanced Core (33 units)

The following courses for 33 units are required as outlined below:

Take the following four (4) courses for 12 units:
DATA 312 - Data Analysis with Python *Units: 3*
MATH 205 - Math for Data Science 2 *Units: 3*
STAT 321 - Probability Through Simulation *Units: 3*
STAT 330 - Statistical Inference *Units: 3*

Take any ONE of the following CS courses for 3 units:
CS 200 - Advanced Programming for Everyone *Units: 3*

Take all of the following six (6) courses for 18 units:
DATA 340 - Data Science Ethics *Units: 3*
STAT 432 - Introduction to Linear Regression and Logistic Regression *Units: 3*
STAT 450 - Introduction to R for Data Science *Units: 3*
STAT 451 - Introduction to Data Visualization *Units: 3*
STAT 452 - Introduction to Statistical Learning *Units: 3*
DATA 492 - Capstone Project *Units: 3*

FAST Program Courses (12 units)

Students must complete three (3) courses of the following for 12 units:

- STAT 620 – Probability and Statistical Theory Units: 4
- STAT 630 – Statistical Methods Units: 4
- STAT 633A – Generalized Linear Models I Units: 4

Other Undergraduate Degree Requirements

In addition to major requirements, every student must also complete the University's baccalaureate requirements for graduation, which are described in the Undergrad Baccalaureate & Program Requirements chapter of this catalog.

Statistics, M.S. Program (22 units)

Foundation Requirements

The M.S. in Statistics program consists of at least 22 semester units of approved upper division and graduate work beyond the 12 FAST units listed above. The university requirement for the minimum number of 600-level units applies. All work applied toward

the 34 units must be at an average grade of “B” (3.0) or higher. No graduate-level required course may be at a grade below “B-.”

Core Courses (8 units)

The following 8 units are required:

STAT 633B - Generalized Linear Models II *Units: 4*
STAT 640A - Advanced Statistical Theory I *Units: 2*
And, one (1) of the following courses:
STAT 650A - Advanced R for Data Science *Units: 2*
OR STAT 650B - Python for Data Science *Units: 2*

Concentrations (12 units)

Students may select one (1) concentration listed below for 12 units, or students may choose no concentration that requires 12 units of approved electives to complete the degree:

- Statistics, M.S. *(See “Additional Electives”)*
- Statistics, M.S.: Actuarial Science Concentration
- Statistics, M.S.: Applied Statistics Concentration
- Statistics, M.S.: Data Science Concentration
- Statistics, M.S.: Mathematical Statistics Concentration

Actuarial Science Concentration

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12 units to be completed from the following:

Choose 6 units from the following:

- BSTA 661 - Categorical Data Analysis *Units: 2*
- BSTA 662 - Survival Analysis *Units: 2*
- BSTA 668 - Longitudinal Data Analysis *Units: 2*
- STAT 673 - Nonparametric Statistical Methods *Units: 2*
- STAT 674 - Time Series *Units: 2*

Choose an additional 6 units from:

- An additional course listed above
- An approved course from the Department of Statistics and Biostatistics

Note: Courses not listed above require advance approval from the graduate advisor.

Applied Statistics Concentration

Choose six (6) courses for 12 units from the following:

- BSTA 661 - Categorical Data Analysis *Units: 2*
- BSTA 662 - Survival Analysis *Units: 2*
- BSTA 668 - Longitudinal Data Analysis *Units: 2*
- STAT 640B - Advanced Statistical Theory II *Units: 2*
- STAT 650A - Advanced R for Data Science *Units: 2*
- STAT 651 - Data Visualization *Units: 2*
- STAT 652 - Statistical Learning *Units: 2*
- STAT 653 - Statistical Natural Language Processing *Units: 2*
- STAT 654 - Introduction to Applied Deep Learning *Units: 2*
- STAT 660 - Advanced SAS I *Units: 2*
- STAT 673 - Nonparametric Statistical Methods *Units: 2*
- STAT 674 - Time Series *Units: 2*

Data Science Concentration

Take 12 units from the following:

STAT 651 - Data Visualization *Units: 2*
STAT 652 - Statistical Learning *Units: 2*
STAT 653 - Statistical Natural Language Processing *Units: 2*
STAT 654 - Introduction to Applied Deep Learning *Units: 2*
Plus, any approved STAT or BSTA for 4 units.

Mathematical Statistics Concentration

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12 units from below:

Take the following course:
STAT 640B - Advanced Statistical Theory II *Units: 2*

Plus, take a minimum of 10 units from below:
MATH 310 - Linear Algebra Theory *Units: 3*
MATH 330 - Analysis I *Units: 3*
MATH 331 - Analysis II *Units: 3*
STAT 641 - Bootstrapping Methods *Units: 2*
STAT 652 - Statistical Learning *Units: 2*
STAT 673 - Nonparametric Statistical Methods *Units: 2*

STAT 674 - Time Series *Units: 2*
STAT 675 - Advanced Stochastic Processes and Simulation *Units: 2*

Additional Electives

Students who do not select a concentration must take 12 units of electives approved by a department advisor to complete the degree.

Statistics, M.S. Capstone Requirement (2 units)

The following capstone for 2 units is required:

- STAT 692 - Comprehensive Exam Review *Units: 2*

Other Graduate & Post-Baccalaureate Degree Requirements

In addition to departmental requirements, every student must also satisfy the University requirements for graduation as described throughout this catalog. These include the 70% unit residence requirement; the five-year rule on currency of subject matter; the minimum number of units in 600-level courses; the “C” minimum grade for each graduate course; and the 3.00 grade point average in all units counted towards the degree.