BS in DATA SCIENCE Degree Requirements*

Premajor Requirements

C or better in each course, and a minimum 3.0 average GPA (overall and within pre-major courses) required to apply for full major status.

1. CS 1030, Foundations of CS[1] _____(3)
2. CS 1410, Object-Orient. Prog. _____(4)
3. CS 2420, Algorithms/Data Struct. _____(4)
4. Math 1310, Engineering Calculus I (QR) _____(4)
5. Math 1320, Engineering Calculus II (QR) _____(4)

General Ed Requirements

Honors options also accepted for WR2, CW, and AI requirements.

1. Wrtg 2010, Intermediate Writing (WR2) _____(3)
2. Wrtg 3012 or 3014 or 3015 (CW) _____(3)
3. American Institutions (AI) _____(3)

Specific Ethics of Data course

4. CS 4962, Ethics in Data Science (BF?) _____(3)

FIVE more Intellectual Exploration (IE) courses required. TWO must be upper division (3000-level or above), ONE must satisfy the Diversity requirement, and ONE must satisfy the International requirement.

5. Fine Arts (FF): _____(3)
6. Fine Arts (FF): _____(3)
7. Humanities (HF): _____(3)
8. Humanities (HF): _____(3)
9. Social/Behavioral Science (BF): _____(3)

Recommend ECON 2010 or ECON 2020

- *Upper Division (3000+ level IE)* _____
- *Upper Division (3000+ level IE)* _____
- *Diversity (DV)* _____
- *International (IR)* _____

Analytical Foundations[2]

1. CS 2100, Discrete Structures _____(3)
2. Math 2270, Linear Algebra _____(4)
3. Math 3070, Applied Statistics 1 _____(4)
   or CS 3130/ECE 3530, Eng. Prob Stats _____(3)
4. Math 3080, Applied Statistics 2 _____(4)
5. CS 3190, Foundations of Data Analysis _____(3)

Computing Foundations[2]

1. DS 2500, Data Wrangling _____(3)
2. CS 3500, Software Practice I _____(4)
3. CS 4150, Algorithms _____(3)

Core Data Science[2]

2.5 GPA required to graduate.

1. CS 5140, Data Mining _____(3)
2. CS 5350, Machine Learning _____(3)
3. CS 5530, Database Systems _____(3)
4. CS 5630, Visualization for Data Science _____(3)

Elective - Data Analysis Breadth[2]

Must choose 3 classes, with program director consent. 2.5 GPA required to graduate. Below are pre-approved options.

1. CS 3540, Human Computer Interactions _____(3)
2. CS 4300, Artificial Intelligence _____(3)
3. CS 4640, Image Processing Basics _____(3)
4. Math 5010, Intro to Probability _____(3)
5. Math 5040, Stochastic Processes 1 _____(3)
6. Math 5080, Statistical Inference 1 _____(3)
7. Math 5090, Statistical Inference 2 _____(3)
8. Math 5770, Optimization _____(3)
9. CS 5150, Advanced Algorithms _____(3)
10. CS 5340, Natural Language Processing _____(3)
11. CS 5635, Visualization for Scientific Data _____(3)

Elective - Data Domain[2]

Must choose 3 classes, with program director consent. Below are pre-approved.

1. ATMOS 3000, Professional Dev in Atm. Sci. _(2)
2. ATMOS 5340, Envir. Progr. & Data Analysis _(3)
3. ATMOS 5400, The Climate System _____(3)
4. ECON 5190, Health Economics _____(3)
5. GEOG 3400, Population Geography _____(4)
6. GEOG 4140, Methods in GIS _____(4)
7. GEOG 5150, Spatial Data Design GIS _____(4)
8. GEO 3060, Structural Geo and Tectonics _____(3)
9. GEO 3070, Petrology for Engineers _____(2)
10. LING 4020, Introduction to Syntax _____(3)
11. LING 5300, Computational Linguistics _____(3)
12. BMI 6015, Applied Machine Learn. in BMI _(3)
13. BME 6770, Genomic Signal Processing _____(3)

Capstone Requirements[2]

Choose ONE set (to be replaced with DS-specific ones):

1. CS 4000, Senior Capstone Design _____(3)
2. CS 4500, Senior Capstone Project _____(3)

or

1. CS 4940, Undergraduate Research _____(3)
2. CS 4970, Bachelors Thesis _____(3)

*Must reach total of at least 122 credit hours. This degree requires at least 108 hours.

[1] Students may test out of CS 1030.

[2] All DS required courses must be passed with a C or better.

Example 4 year plan (take CS 1030)

Year 1

Fall Semester (16 credits)
- CS 1030, Foundations of CS (3)
- Math 1310, Engineering Calculus I (QR) (4)
- [[Wrtg 2010, Intermediate Writing (WR2) (3)]]
- [[American Institutions (AI) (3)]]
- [[Humanities (HF): (3)]]

Spring Semester (14 credits)
- CS 1410, Object-Orient. Prog. (4)
- Math 1320, Engineering Calculus II (QR) (4)
- [[Wrtg 3012 or 3014 or 3015 (CW) (3)]]
- [[Social/Behavioral Science (BF): (3)]]

Year 2

Fall Semester (17 credits)
- CS 2420, Algorithms/Data Struct. (4)
- Math 3070, Applied Statistics 1 (4)
- Math 2270, Linear Algebra (4)
- ELEC:[ATMOS 3000, Professional Dev in Atm. Sci. (2)]
- [[Humanities (HF): (3)]]

Spring Semester (16 credits)
- CS 2100, Discrete Structures (3)
- DS 2500, Data Wrangling (3)
- Math 3080, Applied Statistics 2 (4)
- [[Fine Arts (FF): (3)]]
- [[Elective]] (3)

Year 3

Fall Semester (16 credits)
- CS 3190, Foundations of Data Analysis (3)
- CS 3500, Software Practice I (4)
- CS 5630, Visualization for Data Science (3)
- ELEC:[CS 3540, Human Computer Interactions (3)]
- ELEC:[ATMOS 5340, Envir. Progr. & Data Analysis (3)]

Spring Semester (15 credits)
- CS 4150, Algorithms (3)
- CS 5140, Data Mining (3)
- CS 5530, Database Systems (3)
- ELEC:[ATMOS 5400, The Climate System (3)]
- [[Elective]] (3)

Year 4

Fall Semester (12 credits)
- CS 4940, Undergraduate Research (3)
- CS 5350, Machine Learning (3)
- [[CS 4962, Ethics in Data Science (BF?) (3)]]
- ELEC:[Math 5080, Statistical Inference 1 (3)]

Spring Semester (16 credits)
- CS 4970, Bachelors Thesis (3)
- ELEC:[Math 5090, Statistical Inference 2 (3)]
- ELEC:[CS 4300, Artificial Intelligence (3)]
- [[Fine Arts (FF): (3)]]
- [[Elective]] (4)

Example 4 year plan (skip CS 1030)

Year 1

Fall Semester (14 credits)
- CS 1410, Object-Orient. Prog. (4)
- Math 1310, Engineering Calculus I (QR) (4)
- Wrtg 2010, Intermediate Writing (WR2) (3)
- [[American Institutions (AI) (3)]]

Spring Semester (16 credits)
- CS 2100, Discrete Structures (3)
- DS 2500, Data Wrangling (3)
- Math 1320, Engineering Calculus II (QR) (4)
- [[Wrtg 3012 or 3014 or 3015 (CW) (3)]]
- [[Fine Arts (FF): (3)]]

Year 2

Fall Semester (15 credits)
- CS 2420, Algorithms/Data Struct. (4)
- Math 2270, Linear Algebra (4)
- Math 3070, Applied Statistics 1 (4)
- ELEC:[CS 3540, Human Computer Interactions (3)]

Spring Semester (17 credits)
- CS 3500, Software Practice I (4)
- Math 3080, Applied Statistics 2 (4)
- [[Fine Arts (FF): (3)]]
- [[Elective]] (3)
- [[Elective]] (3)

Year 3

Fall Semester (15 credits)
- CS 3190, Foundations of Data Analysis (3)
- CS 4150, Algorithms (3)
- CS 5630, Visualization for Data Science (3)
- ELEC:[LING 4020, Introduction to Syntax (3)]
- [[CS 4962, Ethics in Data Science (BF?) (3)]]

Spring Semester (15 credits)
- CS 5140, Data Mining (3)
- CS 5530, Database Systems (3)
- ELEC:[CS 4300, Artificial Intelligence (3)]
- ELEC:[LING 5300, Computational Linguistics (3)]
- [[Humanities (HF): (3)]]

Year 4

Fall Semester (15 credits)
- CS 4000, Senior Capstone Design (3)
- CS 5350, Machine Learning (3)
- ELEC:[CS 5340, Natural Language Processing (3)]
- [[Humanities (HF): (3)]]
- [[Elective]] (3)

Spring Semester (15 credits)
- CS 4500, Senior Capstone Project (3)
- ELEC:[BMI 6015, Applied Machine Learn. in BMI (3)]
- [[Social/Behavioral Science (BF): (3)]]
- [[Elective]] (3)
- [[Elective]] (3)