BS in DATA SCIENCE Degree Requirements

2022-2023

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 1400, Intro to Comp Prog (4)
   AND
   CS 1410, Intro to OOP (4)
   OR
   CS 1420 Accel OOP (4)
2. CS 2420, Algorithms/Data Struct. (4)
3. Math 1310, Engineering Calculus I (QR) (4)
4. 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 3014 or 3015 (CW) (3)
3. American Institutions (AI) (3)
3. Fine Arts (FF): (3)
4. Fine Arts (FF): (3)
5. Humanities (HF): (3)
6. Humanities (HF): (3)
7. Social/Behavioral Science (BF): (3)
8. Social/Behavioral Science (BF): (3)

- *Diversity (DV)* _____
- *International (IR)* _____

Analytical Foundations[2]

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

Computing Foundations[2]

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

Core Data Science[2]

2.5 GPA required to graduate.

1. DS 3390, Ethics in Data Science (3)
2. DS 4140, Data Mining (3)
3. DS 4350, Machine Learning (3)
4. DS 4530, Database Systems (3)
5. DS 4630, 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 from here, with program director consent

1. _____ (3)
2. _____ (3)
3. _____ (3)

Capstone Requirements[2]

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

1. DS 4800, Senior Capstone Design (3)
2. DS 4850, Senior Capstone Project (3)

or

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

*Must reach total of at least 122 credit hours. This degree requires at least 108 hours.
All DS required courses must be passed with a C or better

Example 4-year plan (CS 1400)

Year 1

Fall Semester (16 credits)
- CS 1400, Foundations of CS (4)
- 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)
- DS 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)
- DS 5140, Data Mining (3)
- DS 5530, Database Systems (3)
- ELEC:[ATMOS 5400, The Climate System (3)]
- [[Elective]] (3)

Year 4

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

Spring Semester (16 credits)
- DS 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 (CS 1420)

Year 1

Fall Semester (14 credits)
- CS 1420, 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)
- DS 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)
- DS 5140, Data Mining (3)
- DS 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)
- DS 4800, Senior Capstone Design (3)
- DS 5350, Machine Learning (3)
- ELEC:[CS 5340, Natural Language Processing (3)]
- [[Humanities (HF): (3)]]
- [[Elective]] (3)

Spring Semester (15 credits)
- DS 4850, Senior Capstone Project (3)
- ELEC:[BMI 6015, Applied Machine Learn. in BMI (3)]
- [[Social/Behavioral Science (BF): (3)]]
- [[Elective]] (3)
- [[Elective]] (3)

*Must reach total of at least 122 credit hours. This degree requires at least 108 hours.
All DS required courses must be passed with a C or better