Bachelor of Science in Data Science (Artificial Intelligence)

Howard University

College of Arts & Sciences

Catalog: From Fall 2026

Quick Summary - What You Need to Graduate

Total Credits	Minimum GPA	Data Science Credits	Last 30 Credits
120	**2.0**	76	At Howard

Your Degree Breakdown:

- Major Requirements: 76-77 credits (approximately 23 courses)
- General Education: 30+ credits (approximately 15 courses)
- Free Electives: Remaining credits to reach 120 (varies by track)
- Complete all 7 ELOs (can overlap with courses)
- COAS Experimental (1 course) & COAS Innovative Learning (1 course
- Undergraduate Comprehensive Exam

Important: Double-Dipping Made Simple!

One course can fulfill BOTH a General Education requirement AND an Essential Learning Outcome (ELO) at the same time. You don't need separate courses for each! This helps you graduate efficiently without taking extra classes.

Major credits **cannot** be double dipped with minor credits. While students are not required to declare a minor, those who choose to do so must complete **15-18 credits that are not applied toward their major requirements**. Minor coursework must remain distinct and separate from major coursework.

University-Wide Requirements

- **Minimum GPA:** 2.0 for all undergraduate coursework
- **Residency:** Complete last 30 credits at Howard University
- **Exit Requirement:** Undergraduate Comprehensive Exam
- **Total Credits:** 120 credits required

General Education Requirements (30+Credit Hours / ~15 Courses)

Essential Learning Outcomes (ELOs)

Students must complete courses covering all seven outcome areas. Remember, these can overlap with other requirements!

- **ELO 1:** U.S. and Global African Diasporic Developments
- **ELO 2:** Human Cultures and Creative Expression
- **ELO 3:** The Physical and Natural World
- **ELO 4:** Intellectual and Practical Skills – **EGPP 421**
- **ELO 5:** Social Responsibility and Political Institutions – **EGPP 422**
- **ELO 6:** Leadership and Applied Learning
- **ELO 7:** Comprehensive Wellness Practices

Note: ELO courses are tagged in Bison Hub under the course description

Freshman Experience (1 Credit / 1 Course)

- **FRSM 001 -** Freshman Seminar (1 credit)

Core Writing & Communication (12 Credits / 4 Courses)

4 courses needed (each 3 credits)

- **ENGW 101, 102, or 104 -** First-Year English Writing I (3 credits)
- **ENGW 103 or 105 -** First-Year English Writing II (3 credits)
- **Third Writing MATH 795 -** Upper-level writing (3 credits)
- **Principles of Speech (AS) -** (3 credits)

Health & Wellness (2 Credits / 1-2 Courses)

1-2 courses needed (1-2 credits)

- **One-Two HHPL Course -** Health, Human Performance, and Leisure (2 credits)

Cultural and Global Awareness (12 Credits / 4 Courses)

- **African American Cluster Course -** 1 course (3 credits)
- **Foreign Language -** 3 courses (9 credits total, same language)
  (3 credits can be an intercultural knowledge)

Humanities, Social Sciences & Natural Science (18 Credits / 6 Courses)

- **Two Humanities Courses -** 2 courses (3 credits each)
- **Two Social Science Courses –** 2 courses (3 credits each)
- **Two Natural Science Courses** – 2 course (3 credits each)

Free Electives

Remaining credits to reach 120 total (varies based on math track and elective choices)

COAS Special Requirements

Experiential Learning (1 course required)

Examples of COAS Experiential Learning Course but are not limited to:

- Any 890 course
- Internships
- Study abroad

Innovative Learning Requirement (1 course required)

- Complete at least one course marked as 'innovative'

Note: COAS Special Requirements courses are tagged in Bison Hub under the course description

Total Data Science – Business Analytics Major Requirements (76-77 Credits / 23 Courses)

Programming and Computing (12 Credits / 4 Courses)

- **DATA 023** - Foundational Python for Data Science (3 credits)
- **DATA 021** – Computational Social Impact (3 credits)
- **CSCI 100** - Introduction to Computer Science (3 credits)
- **MATH 153 -** Data wrangling & Engineering (3 credits)

Mathematics and Statistical Foundations (31 Credits / 9 Courses)

- **MATH 009** - Introduction to Statistics (4 credits)
- **MATH 014** – Introduction to Data Science (3 credits)
- **MATH 156** - Calculus I (4 credits)
- **MATH 157** - Calculus II (4 credits)
- **MATH 189 -** Probability and Statistics I (3 credits)
- **MATH 190 -** Probability and Statistics II (3 credits)
- **MATH 152 -** Applied Statistics (3 credits)
- **MATH 177 -** Optimization Techniques (4 credits)
- **MATH 181/MATH 103 -** Discrete Structures / Proof & Problem Solving (3 credits)

Data Science and Machine Learning (18 Credits / 5 courses)

- **MATH 163 –** Machine Learning (4 credits)
- **DATA 108 –** Internship Course (3 credits)
- **EGPP 421** – Intro to AI Tools & Techniques (3 credits)
- **Capstone Projects I & II** (4 credits each)

Computer Science Electives (7 credits/ 2 courses)

CSCI 135 – Computer Science I (4 credits)

CSCI 403 - Introduction to Big Data Analysis (3 credits)

Math Electives (3 credits / 1 course)

- **MATH 180 –** Intro to Linear Algebra (3 credits)
- **MATH 164** – Numerical Analysis (3cr)

Computer Science Electives (9 credits / 3 courses)

- **CSCI 136** – Computer Science II (3 credits)
- **CSCI 354** – Computer Science III (3 credits)
- **CSCI 432** – Database Systems (3 credits)
- **CSCI 410** – Modeling & Simulation (3 credits)
- **EGPP 422** - Ethical and Responsible AI
- **CSCI 476** – Introduction to Artificial Intelligence (3 credits)
- **CSCI 211** – Unix Lab (1 credit)
- **CSCI 203** – Object-Oriented Programming using Java (1 credit)
- **CSCI 470** – Fundamentals of Algorithms (3 credits)
- **CSCI 376** – Operations Research (3 credits))

Sample Degree Progress Checklist

Always consult with your academic advisor for personalized guidance

Freshman Year (29 Credits)

Fall Semester (13 Credits)

- Data 023 – Foundational Python for Data Science (3 credits)
- CSCI 100 - Introduction to Computer Science (3 credits)
- Natural Science (3 credits)
- Freshman Seminar (1 credit)
- Freshman English I (3 credits)

Spring Semester (16 Credits)

- MATH 014 – Introduction to Data Science (3 credits)
- MATH 156 – Calculus I (4 credits)
- MATH 009 – Introduction to Statistics (4 credits)
- Freshman English II (3 credits)
- HHPL – Physical Education (2 credits)

Sophomore Year (32 Credits)

Fall Semester (16 Credits)

- MATH 157- Calculus II (4 credits)
- MATH 152 - Applied Statistics (3 credits)
- MATH 153 – Data Wrangling/Engineering (3 credits)
- Social Science I (3 credits)
- World Language I (3 credits)

Spring Semester (16 Credits)

- MATH 163- Machine Learning (4 credits)
- DATA 021 – Computational Social Impact (3 credits)
- MATH Elective (3 credits)
- Social Science II (3 credits)
- World Language – II (3 credits)

Junior Year (32 Credits)

Fall Semester (16 Credits)

- MATH 189 – Probability & Statistics I (3 credits)
- CSCI 135 Computer Science I (4 credits)
- Natural Science II (3 credits)
- Humanities I (3 credits)
- World Language III / Intercultural knowledge (3 credits)

Spring Semester (16 Credits)

- MATH 190 - Probability & Stat II (3 Credits)
- MATH 177 – Optimization Techniques (4 credits)
- DATA 108 – Internship Course (3 credits)
- Humanities II (3 credits)
- CSCI 403 Into to Big Data Analysis (3 credits)

Senior Year (27 Credits)

Fall Semester (14 Credits)

- MATH 181 Discrete Structures/ MATH 103 Proof & Problem Solving (3 credits)
- Computer Science Elective (4 credits)
- EGPP 421 Intro to AI Tools & Techniques (3 credits)
- Capstone Project I (4 credits)

Spring Semester (13 Credits)

- Computer Science Elective (3 credits)
- Computer Science Elective (3 credits)
- African Diasporic Cluster (3 credits)
- Capstone Project II (4 credits)

Key Requirements Summary

- **Minimum Overall GPA:** 2.0
- **Credits in Data Science:** 40 minimum
- **Residency:** Last 30 credits at Howard University

Important Notes for Success

- Experiential Learning: Can often be satisfied through 890 courses, internships, etc. Please speak with your advisor for all options.
- ELO Requirements: Many built in general electives will automatically satisfy ELO requirements.
- Advisor Consultation: Consult with your academic advisor each semester for course planning.
- Scholarship Requirements: Students are required to successfully pass a minimum of 15 credits each semester. There is an exception for students in their final term to take less than 15 credits and still be awarded their scholarship.
- Freshman 0-29 completed credits.
- Sophomore: 30-59 completed credits.
- Junior: 60-89 completed credits.
- Senior: 90 or more completed credits.

Resources & Support

- Academic Advisor: Contact Office of Undergraduate Studies for assignment
- Department Office: Mathematics of Arts & Sciences
- Pre-Health Advising: Available for students interested in medical/dental/veterinary school.
- Research Opportunities: Speak with faculty about laboratory research positions

Always consult with your academic advisor for personalized guidance