Bachelor of Science in Mathematics

(Pure Mathematics)

Howard University

College of Arts & Sciences

Catalog: Fall 2023 – Present

Quick Summary - What You Need to Graduate

Total Credits	Minimum GPA	Math Credits	Last 30 Credits
120	2.0	40	At Howard

Your Degree Breakdown:

- Major Requirements: 40 credits (approximately 12 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 Experiential (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+ Credits / ~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
- **ELO 5:** Social Responsibility and Political Institutions
- **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 (4 Credits / 2 Courses)

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

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 & Philosophy (18 Credits / 7 Courses)

- **Two Humanities Courses -** 2 courses (3 credits)
- **Four Social Science Courses -** 4 courses (3 credits each)
- **Philosophy Elective** – 1 course (3 credits)

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 Pure Math Major Requirements (40 Credits / 12 Courses)

Foundation Courses (37 Credits / 11 Courses)

- **MATH 103** – Proof & Problem Seminar (3 credits)
- **MATH 156 -** Calculus (4 credits)
- **MATH 157 -** Calculus II (4 credits)
- **MATH 158 -** Calculus III (4 credits)
- **MATH 159 –** Differential Equations (3 credits)
- **MATH 180–** Intro to Linear Algebra (3 credits)
- **MATH 185 –** Intro to Complex Variables (3 credits)
- **MATH 195/795 –** Intro to Analysis I / Intro to Analysis Writing (3 credit)
- **MATH 196 –** Introduction to Analysis II (3 credits)
- **MATH 197 –** Intro to Modern Algebra I (3 credits)
- **MATH 199 –** Intro to General Topology (3 credits)

Choose One (3 Credits / 1 Course)

- **MATH 160 –** Advance Calculus for Science & Engineering (3 credits)
- **MATH 164 –** Numerical Analysis (3 credits)
- **MATH 184 –** Intro to Number Theory (3 credits)
- **MATH 186 –** Intro to Differential Geometry (3 credits)
- **MATH 189 –** Probability & Statistics I (3 credits)
- **MATH 191 –** Foundation of Applied Math (3 credits)
- **MATH 198 –** Intro to Modern Algebra II (3 credits)

Computer Science Electives (7 Credits / 2 courses) Strongly Recommended

- **CSCI 100 –** Introduction to Computer Science (3 credits)
- **CSCI 135 –** Computer Science I (4 credits)

Sample Degree Progress Checklist

Always consult with your academic advisor for personalized guidance

Freshman Year (33 Credits)

Fall Semester (16 Credits)

- ☐ FRSM 001 Freshman Seminar (1 credit)
- ☐ ENGW 101/102/104 First-Year Writing I (3 credits)
- ☐ MATH 156 Calculus I (4 credits)
- ☐ CSCI 100 or Free Elective (3 credits)
- ☐ Social Science (3 credits)
- ☐ HHPL (2 credits)

Spring Semester (17 Credits)

- ☐ ENGW 103/105 First-Year Writing II (3 credits)
- ☐ MATH 103 Calculus (4 credits)
- ☐ Math 157 Calculus II (4 credits)
- ☐ Social Science (3 credits)
- ☐ CSCI 135 Computer Science I or Free Elective (3 credits)

Sophomore Year (31 Credits)

Fall Semester (16 Credits)

- ☐ Math 158- Calculus III (4 credits)
- ☐ Foreign Language I (3 credits)
- ☐ Humanities Course (3 credits)
- ☐ Philosophy (3 credits)
- ☐ Free Electives (3 credits)

Spring Semester (15 Credits)

- ☐ MATH 180 Intro to Linear Algebra (3 credits)
- ☐ Social Science (3 credits)
- ☐ Principles of Speech (3 credits)
- ☐ Foreign Language II (3 credits)
- ☐ Free Elective (3 credits)

Junior Year (31 Credits)

Fall Semester (15 Credits)

- ☐ MATH 197 Intro to Modern Algebra I (3 credits)
- ☐ MATH 195/795 Intro to Analysis I (3 credit)
- ☐ Experiential Learning Elective (3 Credits)
- ☐ Foreign Language III (3 credits)
- ☐ Humanities Course (3 credits)

Spring Semester (16 Credits)

- ☐ MATH 159 Differential Equations (4 credits)
- ☐ MATH 196 Intro to Analysis II (3 credits)
- ☐ African Diasporic Cluster (3 credits)
- ☐ Social Science (3 credits)
- ☐ Free Elective (3 credits)

Senior Year (24-30 Credits)

Fall Semester (12-15 Credits)

- ☐ MATH 199 Intro to General Topology (3 credits)
- ☐ MATH Elective (3 credits)
- ☐ COAS Innovative Learning (if not completed)
- ☐ Free Electives as needed to reach 120 credits
- ☐ Take Undergraduate Comprehensive Exam

Spring Semester (12-15 Credits)

- ☐ MATH 185 Intro to Complex Analysis (3 credits)
- ☐ HHPL (2 credits)
- ☐ Free Electives as needed to reach 120 credits
- ☐ Apply for graduation

Key Requirements Summary

- **Minimum Overall GPA:** 2.0
- **Credits in Math:** 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