

Bachelor of Science in Physics

Howard University

College of Arts & Sciences

Catalog: Fall 2023 – Present

Quick Summary - What You Need to Graduate

Total Credits 120	Minimum GPA 2.0	Physics Credits 33	Last 30 Credits At Howard
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Your Degree Breakdown:

- Major Requirements: 33 credits (approximately 14 courses)
- General Education: 30+ credits (approximately 15 courses)
- Math Requirements: 16 credits (4 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 Course** - Upper-level writing (3 credits)
- **Principles of Speech (AS)** - (3 credits)

Health & Wellness (2 Credit / 2 Courses)

2 courses needed (each 1 credit)

- **Two HHPL Course** - Health, Human Performance, and Leisure (1 credit 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 (12 Credits / 4 Courses)

- **Two Humanities Courses** - 2 courses (6 credits)
- **Two Social Science Courses** - 2 courses (3 credits each)

Mathematics Requirements (16 Credits / 4 Courses)

Required Course (3 courses):

- **MATH 156** – Calculus I (4 credits)
- **MATH 157** – Calculus II (4 credits)
- **MATH 158** – Calculus III (4 credits)
- **MATH 159** – Differential Equations (4 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:

- PHYS 990, 991
- 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 Physics Major Requirements (33 Credits / 14 Courses)

Foundation Courses (12 Credits / 6 Courses)

- **PHYS 013** – Physics for Sci & Eng I (3 credits)
- **PHYS 023** – Physics for Sci & Eng I Lab (1 credit)
- **PHYS 014** – Physics for Sci & Eng II (3 credits)
- **PHYS 024** – Physics for Sci & Eng II Lab (1 credit)
- **PHYS 015**– Intro to Modern Physics (3 credits)
- **PHYS 025** – Physics for Sci & Eng III Lab (1 credit)

Upper-Division Courses (21 Credits / 8 Courses)

- **PHYS 175** – Thermodynamics (3 credits)
- **PHYS 182** – Physical Mechanics I (3 credits)
- **PHYS 178** – Electricity & Magnetism I (3 credits)
- **PHYS 190** – Quantum Physics (3 credits)
- **PHYS 702** – Experimental Physics I (3 credits)
- **PHYS 196** - Senior Thesis (1 credit)
- **PHYS 197**- Senior Thesis (1 credit)
- **PHYS XXX**- Direct Reading (1 credit)
- **PHYS XXX**- Concentration Course (3 credits)

Physics Electives

- **PHYS 131** –Plasma Physics (3 credits)
- **PHYS 132** –Introduction to Nuclear and Particle Physics (3 credits)
- **PHYS 140** –Introduction to Astronomy and Astrophysics (3 credits)
- **PHYS 141** –Introduction to Astronomy and Astrophysics (3 credits)
- **PHYS 143** –Observational Astronomy (3 credits)
- **PHYS 145** –Cosmology (3 credits)
- **PHYS 154** –Introduction to Computational Physics I (3 credits)
- **PHYS 155** –Introduction to Computational Physics II (3 credits)
- **PHYS 174** –Introduction to Biophysics (3 credits)
- **PHYS 176** –Optics (3 credits)
- **PHYS 186** –Introduction to Classical Fields and Waves (3 credits)
- **PHYS 192** –Introduction to Mathematical Physics I (3 credits)
- **PHYS 193** – Introduction to Mathematical Physics II (3 credits)

Environmental Studies Electives

- **One Environmental Studies Course**

Free Electives

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

Sample Degree Progress Checklist

Always consult with your academic advisor for personalized guidance

Freshman Year (30 Credits)

Fall Semester (15 Credits)

- FRSM 001 - Freshman Seminar (1 credit)
- PHYS 013 – Physics for Sci & Eng I (3 credits)
- PHYS 023 – Physics for Sci & Eng I Lab (1 credit)
- ENGW 101/102/104 - First-Year Writing I (3 credits)
- MATH 156- Calculus I (4 credits)
- Social Science (3 credits)

Spring Semester (15 Credits)

- ENGW 103/105 - First-Year Writing II (3 credits)
- PHYS 014 – Physics for Sci & Eng II (3 credits)
- PHYS 024 – Physics for Sci & Eng II Lab (1 credit)
- MATH 157- Calculus II (4 credits)
- Social Science (3 credits)
- HHPL – One course (1 credit)

Sophomore Year (29-30 Credits)

Fall Semester (15 Credits)

- PHYS 015– Intro to Modern Physics (3 credits)
- PHYS 025 – Physics for Sci & Eng III Lab (1 credit)
- Foreign Language I (3 credits)
- Humanities Course (3 credits)
- HHPL Course (1 credit)
- MATH 158- Calculus III (4 credits)

Spring Semester (14-15 Credits)

- Math 159- Differential Equations (4 credits)
- PHYS 175 – Thermodynamics (3 credits)
- PHYS XXX- Direct Reading (1 credit)
- Foreign Language II (3 credits)
- Environmental Studies Elective (3-4 credits)

Junior Year (30-32 Credits)

Fall Semester (15 Credits)

- PHYS 182 – Physical Mechanics I (3 credits)
- PHYS 178 – Electricity & Magnetism I (3 credits)
- Free Elective (3 Credits)

- Foreign Language III (3 credits)
- Humanities Course (3 credits)

Spring Semester (15-16 Credits)

- PHYS 702 – Experimental Physics I (3 credits)
- Physics Elective (3 credits)
- Free Elective (3-4 credits)
- Principles of Speech (3 credits)
- African Diasporic Cluster (3 credits)

Senior Year (28-30 Credits)

Fall Semester (14–15 credits)

- PHYS 190 – Quantum Physics (3 credits)
- PHYS 196 - Senior Thesis (1 credit)
- COAS Innovative Learning (if not completed)
- Free Electives as needed to reach 120 credits
- Take Undergraduate Comprehensive Exam

Spring Semester (14-15 credits)

- PHYS 197- Senior Thesis (1 credit)
- PHYS 990- Co Op Experiential Learning Elective (3 Credits)
- Free Electives as needed to reach 120 credits
- Apply for graduation

Key Requirements Summary

- **Minimum Overall GPA:** 2.0
- **Credits in Physics:** 33 minimum
- **Residency:** Last 30 credits at Howard University

Important Notes for Success

- **Experiential Learning:** Can often be satisfied through PHYS 990, PHYS 991, 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:** Physics College of Arts & Sciences
- **Pre-Health Advising:** Available for students interested in medical/dental/veterinary school.
- **Research Opportunities:** Speak with faculty about laboratory research positions

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