

# PHYSICS, BACHELOR OF SCIENCE/MASTER OF SCIENCE

## Requirements for Four-year Bachelor/Master's in Physics

### Requirements for acceptance into the four-year Bachelor/Master's in Physics.

- The program is open only to current JHU undergraduates.
- Interested students should apply no later than the end of the fall semester of their junior year.
- A minimum GPA of 3.6 in courses taken in the department of Physics & Astronomy (PHA) at the time of the application is required.
- The following courses or their analogs must be completed or in progress by the time of the application: AS.171.105 Classical Mechanics I/AS.171.106 Electricity and Magnetism I, AS.173.115 Classical Mechanics Laboratory/AS.173.116 Electricity and Magnetism Laboratory, AS.171.201 Special Relativity/Waves, AS.171.204 Classical Mechanics II, AS.171.301 Electromagnetic Theory II, AS.171.303 Quantum Mechanics I, AS.171.312 Statistical Physics/Thermodynamics.

### As part of the application, the student must submit to the Director of Undergraduate Studies *and* to the application portal - <https://applygrad.jhu.edu/apply/>:

- A research advisor form signed by a faculty member in the Department of Physics & Astronomy who has agreed to supervise a minimum of two semesters of graduate-level research of a scope appropriate for the M.A. degree and on a subject appropriate for the Department of Physics & Astronomy.
- A research plan approved by the research advisor.
- A plan to satisfy the course requirements both for the B.A. or B.Sci. degree in Physics and for the M.A. degree in Physics or Astronomy & Astrophysics by the end of their fourth year at JHU.

### Requirements for completing the four-year Bachelor/Master's in Physics.

- The student must satisfy all JHU requirements for a B.A. in Physics or a B.Sci. in Physics to be eligible for the M.A. degree.
- The student must complete the course requirements for the M.A. degree using courses outside of those used for the B.A. or B.Sci. degree.
- For the M.A. in Physics, the student must complete eight graduate courses. For the M.A. in Astronomy and Astrophysics, the student must complete eight graduate courses plus the AS.172.633 Language Of Astrophysics seminar.
- As part of the eight graduate courses, the student must pass the core graduate courses with a grade of B- or better. For the M.A. in Physics, the core courses are Quantum Mechanics I (AS.171.605 Quantum Mechanics), Quantum Mechanics II (AS.171.606 Quantum Mechanics), Advanced Statistical Mechanics (AS.171.703 Advanced Statistical Mechanics), and Electromagnetic Theory (AS.171.603 Electromagnetic Theory). For the M.A. in Astronomy & Astrophysics, the core courses are Stellar Structure & Evolution (AS.171.611 Stellar Structure and Evolution), Interstellar Medium & Astrophysical Fluid

Dynamics (AS.171.612 Interstellar Medium and Astrophysical Fluid Dynamics), Radiative Processes (AS.171.613 Radiative Astrophysics), and Astrophysical Dynamics (AS.171.627 Astrophysical Dynamics). At most one of the core graduate courses may be replaced with another graduate course with a comparable workload and level, by prior approval of the graduate program committee.

- As part of the eight graduate courses, between two and four of the courses must be research semester courses (AS.171.501 Independent Research- Undergraduate/AS.171.502 Undergraduate Independent Research, at 3 credits per semester).
- For every semester of research, the student must submit written research reports to the graduate program committee of the same format as that required for first- and second year students in the Ph.D. program.
- The student must pass a research examination of the same format as that required for second-year students in the Ph.D. program.
- The student must maintain status as a full time undergraduate while completing the M.A. requirements. The full program (B.A. or B.Sci. plus the M.A. degrees) should be completed in four years or less.