



Pitt

Kenneth P. Dietrich
School of Arts and Sciences

Astronomy Major

www.PhysicsAndAstronomy.Pitt.edu/Undergraduate/Degree-Programs

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The University of Pittsburgh's internationally recognized Department of Physics and Astronomy has been an important leader at the frontier of science and, with 500 PhD alumni, has launched many distinguished careers. Now, at the onset of the 21st Century, the department is maintaining its traditions of excellence and innovation while leading the field in breakthroughs that promise an ever-deeper understanding of the universe. From sub-nuclear particles to the unimaginably large, from the birth of the universe to the edge of technology – and at the intersection of quantum and classical physics – our faculty and students explore the fundamental laws of nature. Students may expect to pursue research that influences many fields, including biology, mathematics, medicine, chemistry, engineering, and computer science.

Required courses for the Astronomy major

The BA in astronomy requires the completion of 39 credits in physics and astronomy and six credits in communication and history and philosophy of science, distributed as follows.

Introductory Physics courses

Select one group

- ___ PHYS 0174 Basic Physics, Science and Engineering 1
- ___ PHYS 0175 Basic Physics, Science and Engineering 2

- ___ PHYS 0475 Intro to Physics, Science and Engineering 1
- ___ PHYS 0476 Intro to Physics, Science and Engineering 2

Introductory Astronomy course

- ___ ASTRON 0113 Introduction to Astronomy

Intermediate and advanced Physics courses

- ___ PHYS 0477 Introduction to Thermodynamics, Relativity, and Quantum Theory
- ___ PHYS 0481 Applications of Modern Physics
- ___ PHYS 1310 Undergraduate Seminar
- ___ PHYS 1331 Mechanics

Laboratory courses

- ___ PHYS 0219 Basic Lab Physics for Science and Engineering (2 cr.) or PHYS 0520 Modern Physical Measurements (3 cr.)
- ___ ASTRON 1263 Techniques of Astronomy (3 cr.)

Intermediate and advanced Astronomy courses; choose at least six credits

- ___ ASTRON 1120 Stars: Stellar Structure and Evolution
- ___ ASTRON 1121 Galaxies and Cosmology
- ___ ASTRON 1122 The Solar System and Exoplanets *

* GEOL 1701 Geology of the Planets may be substituted

Prerequisite Mathematics courses

- ___ MATH 0220 Analytic Geometry and Calculus 1
- ___ MATH 0230 Analytic Geometry and Calculus 2
- ___ MATH 0240 Analytic Geometry and Calculus 3
- ___ MATH 0290 or MATH 1270 Differential Equations

Science electives; choose at least six credits *

- ___ BIOSC 0150 Foundations of Biology 1
- ___ BIOSC 0160 Foundations of Biology 2
- ___ BIOE 1070 Introduction to Cell Biology 1
- ___ BIOE 1071 Introduction to Cell Biology 2
- ___ CHEM 0110 General Chemistry 1 or CHEM 0710 Honors General Chemistry 1
- ___ CHEM 0120 General Chemistry 2 or CHEM 0720 Honors General Chemistry 2
- ___ CHEM 0310 Organic Chemistry 1 or CHEM 0730 Honors Organic Chemistry 1
- ___ CHEM 0320 Organic Chemistry 2 or CHEM 0740 Honors Organic Chemistry 2
- ___ CHEM 1410 Physical Chemistry 1
- ___ CHEM 1420 Physical Chemistry 2
- ___ CS 0401 Intermediate Programming using Java
- ___ CS 0445 Data Structures
- ___ GEOL 0040 Physical Geology
- ___ GEOL 1410 Exploration Geophysics
- ___ GEOL 1701 Geology of the Planets **
- ___ MATH 0280 or MATH 1180 or MATH 1185 Linear Algebra
- ___ MATH 1470 Partial Differential Equations
- ___ MATH 1550 Vector Analysis and Applications
- ___ MATH 1560 Complex Variables and Applications
- ___ PHYS 1321 Computational Methods in Physics
- ___ PHYS 1341 Thermodynamics and Statistical Mechanics
- ___ PHYS 1351 Intermediate Electricity/Magnetism
- ___ PHYS 1370 Quantum Mechanics 1
- ___ PHYS 1378 Introduction to Nuclear/Particle Physics
- ___ STAT 1151 Introduction to Probability
- ___ STAT 1152 Introduction to Mathematical Statistics

* Some of these courses have prerequisites

** If this course is taken as a science elective, it cannot be used to satisfy the requirement for nine credits of intermediate and advanced courses.

Course in the history and philosophy of science or science policy/management; choose at least three credits

- ___ BUSERV 1915 Introduction to Management
- ___ PHYS 0086 Physics and Public Policy
- ___ PHYS 0087 Nuclear Science and Society
- ___ PUBSRV 1315 Managing Projects and Contracts
- ___ Any course in the Department of History and Philosophy of Science (HPS)

Writing or communication courses; choose at least three credits

- ___ COMMRC 0320 Mass Communication Process
- ___ COMMRC 0520 Public Speaking
- ___ COMMRC 1105 Television and Society
- ___ ENGCOMP 0400 Written Professional Communication
- ___ ENGCOMP 1101 Language of Science & Technology
- ___ ENGCOMP 1400 Grant and Proposal Writing
- ___ ENGWRT 1330 Intermediate Nonfiction
- ___ ENGWRT 1340 Advanced Nonfiction
- ___ ENGWRT 1394 Science Writing
- ___ LING 1000 Introduction to Linguistics

Grade requirements

A minimum GPA of 2.0 in departmental courses is required for graduation.

Satisfactory/No Credit option

No PHYS or ASTRON courses beyond the introductory level may be taken on an S/NC basis.

Writing (W) requirement

Students must complete at least one W-course in the major.

Honors major requirements

Honors in astronomy is granted if in addition to fulfilling all requirements for the major, the student maintains a GPA of 3.2 or higher in the major, a cumulative GPA of 3.0 or higher, completes ASTRON 1903 or PHYS 1903 Directed Research, submits a paper detailing the research within the department, and presents the research in a public forum (i.e. at the University's Science Symposium, the undergraduate poster fair hosted by the University Honors College).

Science Communication concentration

This concentration replaces the three-credit writing or communication course with a three-credit writing course and 12 credits of communication courses. Students pursuing this concentration may replace the six credits of science electives with the communication course requirements.

Required writing course

- ___ ENGCOMP 0400 Written Professional Communication

Communication courses; choose at least 12 credits

- ___ ENGCOMP 1101 Language of Science & Technology
- ___ ENGCOMP 1400 Grant and Proposal Writing
- ___ COMMRC 0320 Mass Communication Process
- ___ COMMRC 0520 Public Speaking
- ___ COMMRC 1105 Television and Society
- ___ ENGWRT 0610 Introduction to Journalism and Non-fiction
- ___ ENGWRT 1330 Intermediate Nonfiction
- ___ ENGWRT 1340 Advanced Nonfiction
- ___ ENGWRT 1394 Science Writing
- ___ LING 1000 Introduction to Linguistics

Science Breadth concentration

This concentration provides broader exposure to other sciences in comparison to the standard Astronomy BA, while going into greater depth in physics and astronomy than a more generic Natural Sciences major. With proper selection of courses, this concentration provides the necessary requirements to apply for admission to medical school while roughly matching the credit requirements of the Astronomy BA.

Reduced physics requirements

- ___ PHYS 0481 Applications of Modern Physics *

* PHYS 0481 may be used for the Physics minor

Reduced writing requirements

The three-credit writing or communication requirement is waived for students pursuing this concentration.

Added science requirements; choose two of the three tracks, totaling at least 16 credits

- ___ CHEM 0110 General Chemistry 1 or CHEM 0710 Honors General Chemistry 1
- ___ CHEM 0120 General Chemistry 2 or CHEM 0720 Honors General Chemistry 2

- ___ BIOSC 0057 Foundations of Biology Research Lab 1
- ___ BIOSC 0067 Foundations of Biology Research Lab 2
- ___ BIOSC 0150 Foundations of Biology 1
- ___ BIOSC 0160 Foundations of Biology 2

or

- ___ BIOSC 0057 Foundations of Biology Research Lab 1
- ___ BIOSC 0067 Foundations of Biology Research Lab 2
- ___ BIOE 1070 Introduction to Cell Biology 1
- ___ BIOE 1071 Introduction to Cell Biology 2

- ___ GEOL 0040 Physical Geology
- ___ GEOL 0050 Physical Geology
- ___ GEOL 0890 Physical Oceanography

Added science electives; choose one of the three tracks totaling at least six credits

- ___ CHEM 0310 Organic Chemistry 1 or CHEM 0730 Honors Organic Chemistry 1
- ___ CHEM 0320 Organic Chemistry 2 or CHEM 0740 Honors Organic Chemistry 2
- ___ CHEM 0330 Organic Chemistry 1 Lab
- ___ CHEM 0340 Organic Chemistry 2 Lab or 0750 Honors Organic Chemistry 2 Lab
- ___ CS 0401 Intermediate Programming using Java
- ___ CS 0445 Data Structures

Two advanced courses in Biological Sciences (BIOSC), Bioengineering (BIOE), Chemistry (CHEM), Computer Science (CS), or Geology (GEOL).

Advising

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