SCIENCE

The core science requirement aims to develop critical awareness of the methods and limits of scientific inquiry, while fostering observational and analytical skills, particularly in reference to the natural and physical world. When choosing a science course, students should make sure they have reviewed and met the specified prerequisites for the course prior to enrollment.

Students who are considering careers in science-related fields, including health-related professions, are urged to begin their study of science within the first two semesters after matriculation at GS.

To fulfill the science requirement, students must successfully complete three courses selected from two of the following Columbia departments or from the list of approved courses below, no more than two of which should be from the same department:

- Astronomy
- Biological Sciences
- Chemistry
- Earth and Environmental Sciences
- Ecology, Evolution, and Environmental Biology
- Physics
- Psychology (Columbia department only, excluding courses numbered at the 2600, 3600, or 4600 level)

Students may also use international high school leaving exams for which they received at least three transfer credits on the Entrance Credit Report (ECR) in one of the disciplines listed above to fulfill one of the three science requirement courses.

List of Approved Science Courses

The list of approved courses that fulfill the science requirement includes recommended sequences, science courses for non-science majors, and approved courses from departments not listed above and Barnard.

The following two courses may satisfy both the QR requirement and one science requirement when passed with a letter-grade of C or above. The P/D/F grading options is not available for either of these two courses.

- Foundations of Science (SCNC UN1212)
  Using modern, student-centered, active and collaborative learning techniques, students will engage — through field observations, in-class experiments, computer simulations, and selected readings — with a range of ideas and techniques designed to integrate and anchor scientific habits of mind. Topics covered will include statistics, basic probability, a variety of calculations skills, graph reading and estimation, all aimed at elucidating such concepts as energy, matter, cells, and genes in the context of astronomy, biology, chemistry, earth sciences, neuroscience, and physics.

- Frontiers of Science (SCNC CC1000)
  The principal objectives of Frontiers of Science are to engage students in the process of discovery by exploring topics at the forefront of science and to inculcate or reinforce the specific habits of mind that inform a scientific perspective on the world. Sample topics include the evolution of human language, brain dynamics, global climate change, the nanoworld, and biodiversity, among others.

GS students interested in taking this course should have earned a minimum score of 16 on the GS Quantitative Reasoning Exam, and should also read the first chapter of the electronic textbook Scientific Habits of Mind and take the self-exam prior to enrolling in the course.

Courses Designed For Nonscience Majors

### Astronomy
- ASTR UN1234 The Universal Timekeeper
  Reconstructing History Atom by Atom
- ASTR UN1403 Earth, Moon and Planets
  (Lecture)
- ASTR UN1404 Stars, Galaxies and Cosmology
  (Lecture)
- ASTR UN1420 Galaxies and Cosmology
- ASTR UN1453 Another Earth
- ASTR UN1610 Theories of the Universe: From Babylon to the Big Bang
- ASTR UN1836 Stars and Atoms
- ASTR BC1753 Life in the Universe
- ASTR BC1754 Stars, Galaxies, and Cosmology

Recommended Sequences:

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<tr>
<th>Course Code</th>
<th>Course Name</th>
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<tbody>
<tr>
<td>ASTR UN1403</td>
<td>Earth, Moon and Planets</td>
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<td>- ASTR UN1404</td>
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### Biology
- BIOL UN1002 Theory and Practice of Science: Biology
- BIOL UN1130 Genes and Development

### Computer Science
- COMS W1001 Introduction to Information Science
- COMS W1002 Computing in Context

### Earth and Environmental Engineering
- EAE E2100 A better planet by design

### Earth and Environmental Sciences
- EESC UN1001 Dinosaurs and the History of Life: Lectures and Lab
- EESC UN1003 Climate and Society: Case Studies
- EESC UN1011 Earth: Origin, Evolution, Processes, Future
- EESC UN1030 Oceanography
- EESC UN1053 Planet Earth
- EESC UN1201 Environmental Risks and Disasters
- EESC UN1401 Dinosaurs and the History of Life: Lectures
- EESC UN1411 Earth: Origin, Evolution, Processes, Future: Lectures
- EESC UN2330 Science for Sustainable Development

### Ecology, Evolution, and Environmental Biology
- EEEB W1001 Biodiversity
- EEEB UN1010 Human Origins and Evolution
- EEEB UN1011 Behavioral Biology of the Living Primates
- EEEB S115S The Life Aquatic

Recommended Sequences:
### Additional Courses Approved for the Science Requirement

Most of the following courses have required prerequisites and/or require instructor approval. Prerequisite and instructor approval requirements can be found in the course descriptions for each course or on the department website.

- **Astronomy**
  - Any 3-point course numbered 2000 or higher

- **Biology**
  - Any 3-point course numbered 2000 or higher

- **Chemistry**
  - Any 3-point course numbered 2000 or higher

- **Computer Science**
  - Any 3-point course numbered 3000 or higher

- **Computing Science - Philosophy (CSPH)**
  - CSPH G4801 Mathematical Logic I
  - CSPH G4802 Math Logic II: Incompleteness

- **Earth and Environmental Sciences**
  - Any 3-point course numbered 3000 or higher

- **Ecology, Evolution, and Environmental Biology**
  - EEEB UN1001 General Chemistry I (Lecture)
  - EEEB UN1002 General Chemistry II (Lecture)
  - EEEB UN1500 General Chemistry Laboratory
  - EEEB UN1604 Intensive General Chemistry (Lecture)
  - EEEB UN2507 Intensive General Chemistry Laboratory
  - Any 3-point course numbered 3000 or higher

- **History-Applied Math**
  - HSAM UN2901 Data: Past, Present, and Future

- **Mathematics**
  - Any 3-point course numbered 1100 or higher

- **Physics**
  - PHYS UN1201 General Physics I
  - PHYS UN1202 General Physics II
  - PHYS UN1401 Introduction to Mechanics and Thermodynamics
  - PHYS UN1402 Introduction to Electricity, Magnetism, and Optics
  - PHYS UN1403 Introduction to Classical and Quantum Waves
  - PHYS UN1601 Physics, I: Mechanics and Relativity
  - PHYS UN1602 Physics, II: Thermodynamics, Electricity, and Magnetism
  - Any 3-point course numbered 2000 or higher

- **Psychology**
  - Any 3-point course numbered 32xx, 34xx, 42xx, or 44xx

- **Statistics**
  - Any 3-point course except STAT W3997

*Note: 2600-, 3600-, or 4600-level psychology courses may not be used to fulfill the science requirement.*
**Note:** These courses may serve as a second term of a recommended sequence starting with Mind, Brain and Behavior (PSYC UN1010) or The Science of Psychology (PSYC UN1001).

**Special Summer Program**

The following special program fulfills two of the three terms of the science requirement.

**Earth Institute Center for Environmental Sustainability [EICES]**

- Summer Ecosystem Experience for Undergraduates (SEE-U) (http://eices.columbia.edu/education-training/see-u): Locations change yearly. Check with the center in the spring semester for details.