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.

Science Requirement

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 who matriculate in spring 2023 or earlier 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. Students who matriculate in fall 2023 and later will not be able to receive science credit for international leaving exams.

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 option 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 Frontiers of Science should have earned a minimum score of 16 on the GS Quantitative Reasoning Exam and/or meet the specific criteria listed in the Quantitative Reasoning section of the website by the specified timelines. Prior to enrolling in Frontiers of Science, students should also read the first chapter of the electronic textbook Scientific Habits of Mind and take the self-exam.

Courses Designed For Nonscience Majors

<table>
<thead>
<tr>
<th>Astronomy</th>
<th></th>
</tr>
</thead>
<tbody>
<tr>
<td>ASTR UN1234</td>
<td>UNIVERSAL TIMEKEEPER</td>
</tr>
<tr>
<td>ASTR UN1403</td>
<td>EARTH, MOON, AND PLANETS</td>
</tr>
<tr>
<td>ASTR UN1404</td>
<td>STARS, GALAXIES # COSMOLOGY</td>
</tr>
<tr>
<td>ASTR UN1420</td>
<td>Galaxies and Cosmology</td>
</tr>
<tr>
<td>ASTR UN1453</td>
<td>ANOTHER EARTH</td>
</tr>
<tr>
<td>ASTR UN1610</td>
<td>THEOR-UNIVERS:BABYLON-BIG BANG</td>
</tr>
<tr>
<td>ASTR UN1836</td>
<td>STARS AND ATOMS</td>
</tr>
<tr>
<td>ASTR BC1753</td>
<td>LIFE IN THE UNIVERSE</td>
</tr>
<tr>
<td>ASTR BC1754</td>
<td>Stars, Galaxies, and Cosmology</td>
</tr>
</tbody>
</table>

Recommended Sequences:

<table>
<thead>
<tr>
<th>Astronomy</th>
<th></th>
</tr>
</thead>
<tbody>
<tr>
<td>ASTR UN1234</td>
<td>UNIVERSAL TIMEKEEPER</td>
</tr>
<tr>
<td>ASTR UN1403</td>
<td>EARTH, MOON, AND PLANETS</td>
</tr>
<tr>
<td>ASTR UN1420</td>
<td>Galaxies and Cosmology</td>
</tr>
<tr>
<td>ASTR UN1403</td>
<td>EARTH, MOON, AND PLANETS</td>
</tr>
<tr>
<td>ASTR UN1404</td>
<td>STARS, GALAXIES # COSMOLOGY</td>
</tr>
<tr>
<td>ASTR UN1453</td>
<td>ANOTHER EARTH</td>
</tr>
<tr>
<td>ASTR UN1610</td>
<td>THEOR-UNIVERS:BABYLON-BIG BANG</td>
</tr>
<tr>
<td>ASTR UN1836</td>
<td>STARS AND ATOMS</td>
</tr>
<tr>
<td>ASTR BC1753</td>
<td>LIFE IN THE UNIVERSE</td>
</tr>
<tr>
<td>ASTR BC1754</td>
<td>Stars, Galaxies, and Cosmology</td>
</tr>
</tbody>
</table>

<table>
<thead>
<tr>
<th>Biology</th>
<th></th>
</tr>
</thead>
<tbody>
<tr>
<td>BIOL UN1002</td>
<td>Theory and Practice of Science: Biology</td>
</tr>
<tr>
<td>BIOL UN1130</td>
<td>GENES AND DEVELOPMENT</td>
</tr>
</tbody>
</table>

<table>
<thead>
<tr>
<th>Computer Science</th>
<th></th>
</tr>
</thead>
<tbody>
<tr>
<td>COMS W1001</td>
<td>Introduction to Information Science</td>
</tr>
<tr>
<td>COMS W1002</td>
<td>COMPUTING IN CONTEXT</td>
</tr>
</tbody>
</table>

<table>
<thead>
<tr>
<th>Earth and Environmental Engineering</th>
<th></th>
</tr>
</thead>
<tbody>
<tr>
<td>EEEB W1001</td>
<td>Biodiversity</td>
</tr>
<tr>
<td>EEEB UN1010</td>
<td>HUMAN ORIGINS # EVOLUTION</td>
</tr>
<tr>
<td>EEEB UN1011</td>
<td>BEHAVIOR BIOL-LIVING PRIMATES</td>
</tr>
<tr>
<td>EEEB S115S</td>
<td>The Life Aquatic</td>
</tr>
</tbody>
</table>
Recommended Sequences:

EEEB UN1001 Biodiversity and CONSERVATION BIOLOGY
- EEEB UN3087
EEEB UN1010 HUMAN ORIGINS # EVOLUTION and BEHAVIOR BIOL-LIVING PRIMATES

Electrical Engineering
ELEN E1101 THE DIGITAL INFORMATION AGE

Food Studies
FSEB UN1020 Food and the Body
FSPH UN1100 FOOD, PUBLIC HEALTH # PUBLIC POLICY

Philosophy
PHIL UN3411 SYMBOLIC LOGIC
PHIL GU4424 MODAL LOGIC

Physics
PHYS UN1001 PHYSICS FOR POETS
PHYS UN1018 WEAPONS OF MASS DESTRUCTION

Recommended Sequences:
PHYS UN1001 PHYSICS FOR POETS
- PHYS C1002 and Physics for Poets

Psychology**

Columbia Department only:
PSYC UN1001 THE SCIENCE OF PSYCHOLOGY
PSYC UN1010 Mind, Brain and Behavior (Effective Fall 2018, this course will no longer be offered. For students who took this course before Fall 2018, it may be used to partially satisfy the Science Requirement.)
PSYC UN1021 Science of Psychology: Explorations and Applications (Effective beginning Spring 2021)

Science
SCNC UN1212 Foundations of Science
SCNC UN1800 ENERGY # ENERGY CONSERVATION

Statistics
STAT UN1001 INTRO TO STATISTICAL REASONING
STAT UN1010 Statistical Thinking For Data Science

* Note: Students electing to take Human Origins and Evolution (EEEB UN1010) and Behavioral Biology of the Living Primates (EEEB UN1011) as a sequence are recommended, but not required, to take EEEB UN1010 before EEEB UN1011.
** Note: 2600-, 3600-, or 4600-level psychology courses may not be used to fulfill the science requirement.

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
CHEM UN1403 GENERAL CHEMISTRY I-LECTURES
CHEM UN1404 GENERAL CHEMISTRY II-LECTURES
CHEM UN1500 GENERAL CHEMISTRY LABORATORY
CHEM UN1604 2ND TERM GEN CHEM (INTENSIVE)
CHEM UN2507 Intensive General Chemistry Laboratory
Any 3-point course numbered 3000 or higher

Computer Science
COMS W1004 Introduction to Computer Science and Programming in Java
COMS W1005 Introduction to Computer Science and Programming in MATLAB
ENGI E1006 INTRO TO COMP FOR ENG/APP SCI
COMS W1007 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
EESC UN2100 EARTH'S ENVIRO SYST: CLIM SYST
EESC UN2200 EARTH'S ENVIRONMENTAL SYSTEMS: THE SOLID EARTH
EESC UN2300 EARTH'S ENVIRO SYST LIFE SYST
Any 3-point course numbered 3000 or higher

Ecology, Evolution, and Environmental Biology
EEEB UN2001 ENVIRONMENTAL BIOLOGY I
EEEB UN2002 ENVIRONMENTAL BIOLOGY II
EEEB UN3087 CONSERVATION BIOLOGY (Any 3-point course numbered 3000 or higher except EEEB GU4321 or EEEB GU4700)

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 INTRO TO MECHANICS # THERMO
PHYS UN1402 INTRO ELEC/MAGNETSM # OPTICS
PHYS UN1403 INTRO-CLASSCL # QUANTUM WAVES
PHYS UN1601 PHYSICS I:MECHANICS/RELATIVITY
PHYS UN1602 PHYSICS II: THERMO, ELEC # MAG
Any 3-point course numbered 2000 or higher

Psychology*
Any 3-point course numbered 22xx, 24xx, 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 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):
  Locations change yearly. Check with the center in the spring semester for details.