

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

Astronomy

ASTR UN1234	UNIVERSAL TIMEKEEPER
ASTR UN1403	EARTH, MOON, AND PLANETS
ASTR UN1404	STARS, GALAXIES # COSMOLOGY
ASTR UN1420	Galaxies and Cosmology
ASTR UN1453	ANOTHER EARTH
ASTR UN1610	THEOR-UNIVERS:BABYLON-BIG BANG
ASTR UN1836	STARS AND ATOMS
ASTR BC1753	LIFE IN THE UNIVERSE
ASTR BC1754	Stars, Galaxies, and Cosmology

Recommended Sequences:

ASTR UN1403 - ASTR UN1404	EARTH, MOON, AND PLANETS and STARS, GALAXIES # COSMOLOGY
ASTR UN1403 - ASTR UN1420	EARTH, MOON, AND PLANETS and Galaxies and Cosmology
ASTR UN1403 - ASTR UN1836	EARTH, MOON, AND PLANETS and STARS AND ATOMS
ASTR UN1403 - ASTR BC1754	EARTH, MOON, AND PLANETS and Stars, Galaxies, and Cosmology
ASTR BC1753 - ASTR UN1404	LIFE IN THE UNIVERSE and STARS, GALAXIES # COSMOLOGY
ASTR BC1753 - ASTR BC1754	LIFE IN THE UNIVERSE and Stars, Galaxies, and Cosmology

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
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Earth and Environmental Sciences

EESC UN1001	DINOSAURS AND HISTORY OF LIFE
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	DINOSAUR # HISTORY OF LIFE-LEC
EESC UN1411	Earth: Origin, Evolution, Processes, Future: Lectures
EESC UN2330	SCIENCE FOR SUSTAINABLE DEVPT

Ecology, Evolution, and Environmental Biology

EEEB W1001	Biodiversity
EEEB UN1010	HUMAN ORIGINS # EVOLUTION
EEEB UN1011	BEHAVIOR BIOL-LIVING PRIMATES
EEEB S1115S	The Life Aquatic

Recommended Sequences:

EEEB UN1001 - EEEB UN3087	Biodiversity and CONSERVATION BIOLOGY
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EEEB UN1010 - EEEB UN1011	HUMAN ORIGINS # EVOLUTION and BEHAVIOR BIOL-LIVING PRIMATES
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Electrical Engineering

ELEN E1101	THE DIGITAL INFORMATION AGE
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Food Studies

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

PHIL UN3411	SYMBOLIC LOGIC
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PHIL GU4424	MODAL LOGIC
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Physics

PHYS UN1001	PHYSICS FOR POETS
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PHYS UN1018	WEAPONS OF MASS DESTRUCTION
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Recommended Sequences:

PHYS UN1001 - PHYS C1002	PHYSICS FOR POETS and Physics for Poets
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Psychology**

Columbia Department only:

PSYC UN1001	THE SCIENCE OF PSYCHOLOGY
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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.)
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PSYC UN1021	Science of Psychology: Explorations and Applications (Effective beginning Spring 2021)
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Science

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

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

****Note:** The Science of Psychology (PSYC UN1001) or an equivalent introductory course approved by the Psychology Department must be taken as a prerequisite to any psychology course numbered 22xx or 24xx.

****Note:** Students may not receive credit for both PSYC BC 1101 and PSYC UN 1001. Psychology majors should consult the Psychology department for additional restrictions on overlapping courses.

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

Computer Science

COMS W1004	Introduction to Computer Science and Programming in Java
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COMS W1005	Introduction to Computer Science and Programming in MATLAB
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ENGI E1006	INTRO TO COMP FOR ENG/APP SCI
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COMS W1007	
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Any 3-point course numbered 3000 or higher

Computing Science - Philosophy (CSPH)

CSPH G4801	Mathematical Logic I
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CSPH G4802	Math Logic II: Incompleteness
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Earth and Environmental Sciences

EESC UN2100	EARTH'S ENVIRO SYST: CLIM SYST
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EESC UN2200	EARTH'S ENVIRONMENTAL SYSTEMS: THE SOLID EARTH
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EESC UN2300	EARTH'S ENVIRO SYST: LIFE SYST
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Any 3-point course numbered 3000 or higher

Ecology, Evolution, and Environmental Biology

EEEB UN2001	ENVIRONMENTAL BIOLOGY I
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EEEB UN2002	ENVIRONMENTAL BIOLOGY II
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EEEB UN3087	CONSERVATION BIOLOGY (Any 3-point course numbered 3000 or higher except EEEB GU4321 or EEEB GU4700)
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History-Applied Math

HSAM UN2901	DATA:PAST, PRESENT AND FUTURE
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Mathematics

Any 3-point course numbered 1100 or higher

Physics

PHYS UN1201	GENERAL PHYSICS I
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PHYS UN1202	GENERAL PHYSICS II
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PHYS UN1401	INTRO TO MECHANICS # THERMO
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PHYS UN1402	INTRO ELEC/MAGNETISM # OPTICS
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PHYS UN1403	INTRO-CLASSCL # QUANTUM WAVES
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PHYS UN1601	PHYSICS I:MECHANICS/RELATIVITY
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PHYS UN1602	PHYSICS II: THERMO, ELEC # MAG
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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.