QUANTITATIVE REASONING

Courses that fulfill the quantitative reasoning (QR) core requirement aim to develop critical skills in quantitative analysis and deductive reasoning, which are particularly relevant to the study of science and the social sciences.

QR Requirement Fulfillment

- Scoring a minimum of 600 on the Math SAT or 27 on the math subsection of the ACT within the eight years prior to matriculation;
- Earning a passing score on the GS Quantitative Reasoning Exam (https://gs.columbia.edu/content/placement-exams/#cu_accordion_item-1263);
- Earning a passing letter grade in a course from the list of approved courses;
- Receiving approved transfer credit on the Entrance Credit Report (ECR) in computer science, mathematics, or statistics from international high school leaving exams (e.g., French Baccalaureate, GCE Advanced Level examination, etc.) or courses taken within the eight years prior to matriculation worth three points and equivalent to those classes on the list of approved courses below, as determined by the Dean of Students Office.

Computer Science, Economics, Mathematics, and Statistics

Any course selected from the following departments fulfills the quantitative reasoning requirement when passed with a satisfactory letter grade:

- Computer Science (except S1021D, S1022Q)
- Economics (Columbia department only)
- Mathematics
- Statistics

Approved Columbia courses in computer science, mathematics, and statistics may count toward both the QR requirement and the science requirement. Approved transfer credit for relevant courses in computer science, mathematics, and statistics may count toward both the QR and one science requirement as well; however, the course must have been taken within the last eight years prior to matriculation to satisfy the QR requirement.

College Algebra and Analytic Geometry (MATH UN1003) (or the equivalent) may count toward the QR requirement only.

Foundations of Science

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.

Foundations of Science (SCNC UN1212) satisfies both the QR requirement and one course of the science requirement when passed with a letter-grade of C or above.

Frontiers of Science

The goal of this Columbia Core Curriculum course is to introduce students to the way scientists think. As they delve into questions drawn from fields as varied as neuroscience and astrophysics, students learn why scientists cultivate a sense of scale, why they like to convert data to graphs, and why they are so careful to differentiate correlation from causation. Along the way, students are invited to think about how science might contribute answers to old questions (what is the place of our species in the universe?) and new ones (is continued industrialization an environmentally sustainable proposition?)

Frontiers of Science: Discussion (SCNC CC1100) satisfies both the QR requirement and one course of the science requirement when passed with a letter-grade of C or above. To enroll in Frontiers of Science, students must meet at least one of the following requirements:

- Score of 16 or higher on the GS Quantitative Reasoning Exam
- SAT Math score of 600 or higher within the last three years
- ACT Math score of 27 or higher within the last three years

**Note:** Neither Foundations of Science nor Frontiers of Science may be selected for the P/D/F grading option whether or not they are taken towards the core requirements.

Approved QR Courses

The following Columbia courses have been approved as satisfying the QR requirement if completed with a satisfactory letter grade. This list is updated annually. If a particular quantitative reasoning course does not appear on the list, students should ask their respective GS advisors about its appropriateness for the requirement. Equivalent transfer courses may not count toward the QR requirement.

<table>
<thead>
<tr>
<th>Course Code</th>
<th>Course Title</th>
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<tbody>
<tr>
<td>ECON BC1007</td>
<td>Mathematical Methods for Economics</td>
</tr>
<tr>
<td>ECON BC2411</td>
<td>Statistics for Economics</td>
</tr>
<tr>
<td>EEEB UN3005</td>
<td>Introduction to Statistics for Ecology and Evolutionary Biology</td>
</tr>
<tr>
<td>PHIL UN1401</td>
<td>Introduction to Logic</td>
</tr>
<tr>
<td>PHIL UN3411</td>
<td>Symbolic Logic</td>
</tr>
<tr>
<td>POLS UN3704</td>
<td>Data Analysis and Statistics for Political Science Research</td>
</tr>
<tr>
<td>POLS UN3720</td>
<td>Scope and Methods</td>
</tr>
<tr>
<td>POLS GU4730</td>
<td>Game Theory and Political Theory</td>
</tr>
<tr>
<td>POLS GU4700</td>
<td>Mathematical Methods for Political Science</td>
</tr>
<tr>
<td>POLS GU4710</td>
<td>Principles of Quantitative Political Research</td>
</tr>
<tr>
<td>PSYC BC1101</td>
<td>Statistics</td>
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<tr>
<td>PSYC UN1610</td>
<td>Introductory Statistics for Behavioral Scientists</td>
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<tr>
<td>SOCI W2220</td>
<td>Evaluation of Evidence</td>
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<tr>
<td>SOCI BC3211</td>
<td>Quantitative Methods</td>
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<td>SOCI UN3020</td>
<td>Social Statistics</td>
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<tr>
<td>URBS UN3200</td>
<td>Spatial Analysis: GIS Methods and Urban Case Studies</td>
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**Note:** Barnard students are given preference for enrollment in Barnard courses that may fulfill the QR requirement. Barnard courses that fulfill a core requirement will not necessarily count toward a major at Columbia if a student chooses to major or concentrate in one of these fields. (See individual departments concerning courses approved and required for the major.)
*N.B.: The italicized text on the course description page for BC1007 regarding calculus requirements for economics majors applies to Barnard College students only.