

Quantitative Reasoning Program

Director/Senior Lecturer: *Taylor*

Lecturer: *Polito*

Advisory Committee: *Brabander^{A2} (Geosciences), Ducas^{A2} (Physics), Flynn (Chemistry), Genero (Psychology), Hawes (Education), Keane (Psychology), McGowan^{A1} (Philosophy), Shuchat (Mathematics), Stark^A (Physics), Swingle (Sociology), Wolfson (Chemistry)*

The ability to think clearly and critically about quantitative issues is imperative in contemporary society. Today, quantitative reasoning is required in virtually all academic fields, is used in most every profession, and is necessary for decisionmaking in everyday life. The Quantitative Reasoning Program is designed to ensure that Wellesley College students are proficient in the use of mathematical, logical, and statistical problem-solving tools needed in today's increasingly quantitative world.

The Quantitative Reasoning Program provides a number of services to the academic community. It oversees the administration of the Quantitative Reasoning Assessment (described below) and staffs QR 140, the basic-skills course, and some overlay courses. The Program also provides tutorial support to students and instructors of quantitative reasoning overlay courses. Finally, the Quantitative Reasoning Program provides curricular support to faculty interested in modifying existing courses or designing new ones so that these courses will satisfy the overlay component of the quantitative reasoning requirement.

The Quantitative Reasoning Requirement

All students must satisfy both components of the quantitative reasoning requirement:

the basic-skills component and the overlay course component. The basic-skills component is satisfied either by passing the Quantitative Reasoning Assessment given during Orientation or by passing QR 140, the basic-skills course that builds mathematical skills in the context of real-world applications. Students are required to satisfy the basic skills component in their first year so that they may enroll in the many courses for which basic quantitative skills (including algebra, geometry, basic probability and statistics, graph theory, estimation, and mathematical modeling) are a prerequisite.

The overlay component is satisfied by passing a quantitative reasoning overlay course or by scoring a 5 on the AP Statistics exam. Quantitative reasoning overlay courses emphasize statistical analysis and interpretation of data in a specific discipline. The Committee on Curriculum and Instruction has designated specific courses in fields from across the curriculum as ones that satisfy the quantitative reasoning overlay requirement. These courses (listed below) may also be used to satisfy a distribution requirement. See the Statistics section of the catalog for more information about some of these quantitative reasoning overlay courses.

QR 140 Introduction to Quantitative Reasoning

Polito, Taylor

In this course, students develop and apply mathematical, logical, and statistical skills to solve problems in authentic contexts. The quantitative skills emphasized include algebra, geometry, probability, statistics, estimation, and mathematical modeling. Throughout the course, these skills are used to solve real world problems, from personal finance to medical decision-making. A student passing this course satisfies the basic skills component of the quantitative reasoning requirement. This course is required for students who do not pass the Quantitative Reasoning Assessment. Those who pass the assessment, but still want to enroll in this course must receive permission of the instructor.

Prerequisite: Permission of the instructor required for students with a score of 9.5 or above on the Quantitative Reasoning Assessment.

Distribution: None

Semester: Fall, Spring

Unit: 1.0

QR 180 Statistical Analysis of Education Issues

Taylor

What factors explain individual and group differences in student achievement test scores and educational attainment? Do inequities in financing public elementary and secondary schools matter in terms of student achievement and future employment? This course explores the theories, statistical methods, and data used by social scientists and education researchers in examining these and other education issues. Students collect, analyze, interpret, and present quantitative data. They begin with descriptive statistics and work up to inferential statistics, including hypothesis testing and regression analyses.

Prerequisites: Fulfillment of the basic skills component

of the Quantitative Reasoning requirement. Not open to students who have taken or are taking ECON 103/SOC 190, MATH 101, MATH 101Z, POL 199, PSYC 205, or [QR 199].

Distribution: Social and Behavioral Analysis. Fulfills the Quantitative Reasoning overlay course requirement.

Semester: Spring

Unit: 1.0

Overlay Course Component

The following courses satisfy the overlay course component of the quantitative reasoning requirement. *In order to register for a course on this list, a student must first satisfy the basic skills component of the quantitative reasoning requirement by passing either the quantitative reasoning assessment or QR 140.*

Note that this list is subject to change. Check individual department listings for information about when each course is offered.

[ASTR 109] Our Place in Space and Time

As of 8/10/09

ASTR 206 Astronomical Techniques with Laboratory
BISC 109 Human Biology with Laboratory
BISC 111 Introductory Organismal Biology with Laboratory
[BISC 111DL] Introductory Organismal Biology Discussion with Laboratory
BISC 198 Statistics in the Biosciences
BISC 201 Ecology with Laboratory
CHEM 120 Intensive Introductory Chemistry with Laboratory
CHEM 205 Chemical Analysis and Equilibrium with Laboratory
CHEM 232 Physical Chemistry for the
Life Sciences with Laboratory
CHEM 233 Physical Chemistry I with Laboratory
CHEM 361 Analytical Chemistry with Laboratory
[CS 199] Simulation: An Interdisciplinary Tool
ECON 103/SOC 190 Introduction to Probability and Statistical Methods
[ES 100] Humans and Nature
GEOS 101 Earth Processes and the Environment with Laboratory
GEOS 102 The Dynamic Earth with Laboratory
MATH 101 Reasoning with Data: Elementary Applied Statistics
MATH 101Z Reasoning with Data: Elementary Applied Statistics with Health Applications
MATH 220 Probability and Elementary Statistics
PHIL 209 Scientific Reasoning
PHYS 202 Introduction to Quantum Mechanics and Thermodynamics with Laboratory
POL 199 How to Conduct Research in
Political Science
PSYC 205 Statistics
PSYC 305 Seminar. Advanced Statistical Methods and SPSS
QR 180 Statistical Analysis of Education Issues
SOC 190/ECON 103 Introduction to Probability and Statistical Methods