



**CORE CURRICULUM**  
*Requirement*  
**Quantitative Reasoning - Core**

Date:

Department(s)/Program(s):

Faculty Contact Person(s):

Department Chair/Program Director:

Supported by Department/Program Faculty? Yes      No

Course Number & Title:      \*Note: Course must be approved to run by Faculty Senate before being evaluated by the CCC\*

**RATIONALE | Quantitative Reasoning**

Quantitative reasoning (QR) skills are essential in the modern world. Every professional career demands some ability to understand presentations of quantitative data, analyze them and draw reasonable conclusions, and utilize such data in making arguments. A comprehensive liberal arts education must improve students' appreciation of the value of quantitative approaches to understanding and modes of thought. This requirement offers students the flexibility of acquiring QR in a variety of ways most suitable to their academic objectives.

**OBJECTIVES | Quantitative Reasoning**

Please explain how the proposed course fulfills the following objectives for the Quantitative Reasoning Requirement. **Point to where in the syllabus each objective is met and explain how students will be held accountable through assignments and assessments.** If there are multiple sections that meet the objectives in different ways, specify how, using examples from each syllabus.

**Course Option 1 (STATISTICS) will:**

Teach students the basic elements of statistics including frequency distributions, measures of central tendency, measures of dispersion, the normal distribution, confidence intervals, hypothesis testing and significance.

Examine how quantitative reasoning and evidence are used in constructing substantive arguments.



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Evaluate quantitative claims according to conceptual, statistical, and mathematical criteria.

Demonstrate ways of responsibly communicating quantitative information in graphics and in writing.

**Course Option 2 (CALCULUS) will:**

Provide an introduction to the basic theory of differential or integral calculus.

Demonstrate how calculus can be used to formulate and solve problems in the natural and social sciences.

Evaluate quantitative claims using calculus.



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Demonstrate ways of responsibly communicating quantitative information graphically and in writing.

**Course Option 3 (SET THEORY/LOGIC/PROOF) will:**

Provide an introduction to the language and notations of set theory, propositional logic, and methods of proof.

Apply these methods of proof in areas such as number theory and algebra.

Provide an introduction to combinatorics and probability.

Demonstrate ways of correctly constructing a mathematical argument.

**Course Option 4 (PRACTICAL PROBLEM SOLVING) will:**

Provide an introduction to the mathematics underlying some commonly encountered objects including, for example: debt amortization, the future value of an investment, the present value of an annuity, problems involving elementary probability, the expected value of a random variable, the optimization problems, the utility of matrix operations in solving



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systems of linear equations, the use of Markov chains in analyzing discrete random processes, elementary graph theory, the symmetry of natural world and symmetry in art.

Provide students with examples of practical problems which can be modeled, analyzed and solved using one or more of the mathematical techniques developed within the course.

Require students to become adept at both modeling and solving practical problems using the mathematical ideas developed within the course.

Concentrate on developing students' abilities to communicate mathematical ideas effectively in both written and presentation format.

**COURSE SYLLABUS | Quantitative Reasoning**

\*Email [CCC@providence.edu](mailto:CCC@providence.edu) with this completed form **and** your syllabus/syllabi attached.

**Please Note:** It is expected that in accordance with the [approved syllabus guidelines](#), the final syllabus will include the following:

- An indication of which Core requirement(s) the course satisfies
- A listing of the Core objectives for the requirements