Quantitative Thinking [QQ] [Q]
Skill Course Proposal Form

Department: _____

Instructor: _____

Department Chair
(name/signature/date):   _____

Course Number and Title: _____

When do you want this course designation to go into effect?

                                             _____

This application is for: intensive designation in quantitative thinking [QQ]   _____

                                 practice/exposure designation in quantitative thinking [Q]   _____

Attach this form to the Curriculum Change form.

Attach a sample syllabus.

Quantitative Thinking is defined as the ability to work with and interpret numerical data, as well as to solve and analyze problems using systems of logic across a wide variety of everyday situations.

To fulfill the intensive designation [QQ], **students must take Mathematics 118 or higher** to train in the areas of critical mathematical thinking and problem solving through abstract arguments and proofs.

For an **intensive designation in quantitative thinking [QQ]**, describe how the course fulfills these criteria:

1) Instructs students to proficiently construct logical arguments and rigorous mathematical proofs, and develops the aptitude to produce examples and counter-examples, with a focus on differentiating between coherent mathematical arguments and fallacious ones.

2) Teaches students the difference between inductive and deductive reasoning, including mathematical induction, and how to formulate general hypotheses and conjectures by abstracting general principles from numerical examples and problems.

3) Trains students how to analyze real-world problems quantitatively, formulate reasonable estimates, apply appropriate equations, and differentiate between valid and questionable conclusions.

Courses with the practice/exposure designation [Q] help students interpret quantitative information (both numerical and pertaining to systems of logic) and develop arguments supported by quantitative information expressed in various formats, such as equations, graphs, charts, tables, propositional or symbolic logical arguments, etc.

For a **practice/exposure designation in quantitative thinking** [Q], explain how this course incorporates at least three of the following skills across a substantial proportion of the graded work in a course or laboratory:

1) Representation of quantitative information such as converting information into equations, graphs, diagrams, tables, propositional or symbolic logical arguments, or written descriptions.

2) Interpretation of quantitative information, such as requiring students to explain information presented in quantitative forms (e.g., equations, graphs, diagrams, tables, formal systems of logic, or descriptions of quantitative information).

3) Calculation, such as direct manipulation of quantitative information through data analysis, applying mathematical skills to calculate discipline-specific concepts, or data modeling.

4) Application of quantitative information within a disciplinary context, such as requiring students to base judgments and conclusions on quantitative information.

5) Critical analysis of conclusions based on quantitative information or systems of logic, such as evaluating the value of the data in a given study, distinguishing correlation from causation, understanding assumptions of estimation, modeling, or data analysis and how conclusions are limited by these assumptions, or testing deductive arguments for validity using the tools of propositional or symbolic logic (such as truth tables or truth trees).