There are three broad, non-exclusive categories for QA courses:

1. **Data Analysis and Statistical Inference**

   To explore and evaluate information, both quantitative and qualitative, gathered to assess the plausibility, or validity, of an open question of interest. This may include the construction of graphical and numerical summaries, applications of probability to properly assess the uncertainty surrounding any estimates, or discussions of how to design a study/experiment so that the desired questions are adequately addressed, all in order to make sound decisions based on the gathered data.

2. **Formal symbolic systems**

   To abstract from a concrete situation to a representation in a formal symbolic system whose primary units are not words, and apply this formal system to other specific examples. Some examples of the formal system are symbolic logic, computer programming languages, geometry, number theory, chemical equations and electron-dot notations.

3. **Mathematical models**

   To develop and understand mathematical models for problems that arise in various disciplines. Though these problems are often not explicitly mathematical, mathematical models should be used to gain insights into how systems work, how their component parts interact or contribute to the system’s output and, in many cases, to make predictions about how the system will behave.

A QA course will probably not include all of these categories, but the analysis must be a major and recurring focus of the course and not typically taught in high school.

A common theme in all of these categories is the recognition of patterns, generalization, abstraction to a formal system, and application of the system to specific situations. In addition, an overarching goal is that students learn to understand, communicate, and interpret quantitative information and mathematical ideas.

Specifics of implementation:

1. The QA designation is usually attached to an instructor and the specific course, although certain courses may be designated at QA for all instructors if the course is sufficiently consistent independent of the instructor.

2. We expect QA courses to be at the 100 or 200 level.

3. There will be a periodic reapplication for any course that meets the QA designation.
4. A proposal for a QA course should include a copy of the course syllabus and a one or two paragraph cover page that:

- explains how the course satisfies a QA category or categories
- explicitly addresses how the quantitative analysis will be a major and recurring focus of the course
- indicates if the QA designation will apply to the course independent of the instructor
- describes how the effective integration of QA specific aims with the overall aims of the course will be evaluated. An example evaluation is a set of assignments, exams and projects from the course with a QA component.

5. Proposals should be sent to Jani Benoit, Chair of the QA Committee.