## Quantitative and Analytical Reasoning

### Course Description:

Quantitative and analytical reasoning (QUANT) focuses on understanding and evaluating quantitative or logical assertions, as well as conducting and communicating quantitative or logical analysis by preparing students to read, analyze, and critique mathematical, logical, statistical, and/or algorithmic analyses and increasing their understanding of how such methods are properly used. They also teach students to understand and apply mathematical, logical, statistical, and/or algorithmic methods in a discipline-specific context. A key feature of the QUANT course is that students perform analyses themselves, rather than merely critiquing or interpreting existing work. Students practice, receive feedback, and refine their quantitative skills. The QUANT designation may be attached to a course at any level in any department, and the course need not carry a general education area designation.

1. **Criteria:** QUANT courses will
   1. Engage students in practicing and refining their quantitative skills with feedback from the instructor.
   2. Provide multiple opportunities to critique quantitative or logical assertions made in a variety of sources (e.g., existing logical or mathematical proofs, peer-reviewed academic literature, assertions made in public media) using mathematical, logical, statistical, and/or algorithmic reasoning.
   3. Practice executing and using mathematical, logical, statistical, and/or algorithmic analysis to make decisions and/or solve problems, including thorough examination of assumptions, data quality, and methodology.
   4. Practice articulating the substance and meaning of a critical mathematical, logical, statistical, and/or algorithmic analysis of a complex problem, including assumptions, methods, limitations, broader impacts, and conclusions, with a specific audience. When relevant, students are encouraged to consider ethical/societal implications and historical context.
2. **SLOs:** QUANT students will
   1. Critique quantitative or logical assertions using mathematical, logical, statistical, and/or algorithmic reasoning.
   2. Use mathematical, logical, statistical, and/or algorithmic analysis to make decisions and/or solve problems, including thorough examination of assumptions and utilization of proper methods.
   3. Articulate the substance and meaning of a critical mathematical, logical, statistical, and/or algorithmic analysis of a complex problem, including assumptions, methods, limitations, broader impacts, and conclusions.