

Quantitative Applications

Student Learning Outcome: Students will demonstrate an ability to solve problems within a specified domain through quantitative reasoning.

The Value of Quantitative Applications

Quantitative Applications courses provide students the ability to apply the tools of mathematical and/or statistical analysis to a wide range of subject areas. Students in these courses use information to solve problems in disciplines ranging from the Sciences and Engineering, to Business, to the Social Sciences and Humanities. These courses promote

numeracy and data literacy as skills that enhance the understanding of any topic or subject. Quantitative Applications courses reinforce the quantitative skills developed in the Quantitative Reasoning Foundation.

Supporting Skills

1. Students will identify the appropriate quantitative methods needed to solve domain specific problems.
2. Students will apply appropriate quantitative methods to formulate solutions to domain specific problems.
3. Students will solve domain specific problems through quantitative reasoning.

Course Content Criteria

1. Courses in this category require students to solve problems through the manipulation or analysis of numerical data within a specified domain.
2. Courses in this category require students to identify, select, and recognize numerical data appropriate to solving specific problems, within a specified domain.
3. Courses in this category require students to draw inferences and/or conclusions from visual, numeric, symbolic, and verbal representations of information, within a specified domain.
4. Courses in this category include an assessment assignment that requires students to demonstrate each of the skills in the Quantitative Applications Assessment Rubric (below). This assessment assignment should be one of the following: a homework assignment an objective exam, an essay question on an exam, an essay, or a research paper

Glossary

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1. **Domain:** A specific area of activity, expertise, or knowledge.
2. **Manipulation or analysis of numerical data:** Performing a technique in order to aggregate isolated information into a value or representation that can allow for appropriate interpretation in the context of the data.

Experience Criteria

Students may apply to fulfill the QA requirement through a co-curricular activity. These criteria apply to experiences that meet the QA curricular requirement and describe the characteristics of the experience, the steps a student must follow to petition the experience for approval, and the number and types of assignments students must submit to satisfy the requirement.

1. Students must obtain pre-approval for any activity used to satisfy this component. Approval must be obtained prior to the start of the activity.
2. Students must submit independent, third-party, verification of participation in the approved activity, by a supervisor or other authoritative individual, who is not a blood relation.
3. Activities in fulfillment of this requirement require students to spend at least fifteen total hours solving problems through the manipulation or analysis of numerical data within a specified domain.
4. Activities in fulfillment of this requirement require students to identify, select, and organize numerical data appropriate to solving specific problems within a specified domain.
5. Activities in fulfillment of this requirement require students to draw inferences and/or conclusions from visual, numeric, symbolic, and verbal representations of information, within a specified domain.
6. Students fulfilling Quantitative Applications through an activity must submit either samples of work completed during the activity that demonstrate the student solving problems through the manipulation or analysis of numerical data or a written reflection of approximately 1000 words that responds to the following prompt:

Please describe in detail the activity you used to complete the Quantitative Applications requirement. In your reflection, answer the following questions. How did you meet the requirement of using quantitative data to solve problems? What resources did you use

to understand how best to solve the problems through quantitative reasoning? Who provided feedback on your problem-solving method? How did your ability to solve problems through quantitative reasoning improve?

Quantitative Application Assessment Rubric

Supporting Skills	Exemplary 5	Accomplished 4	Developing 3	Beginning 2	Absent 1
Students will identify the appropriate quantitative methods to solve domain specific problems.	Student is consistently able to identify an appropriate method for solving specific problems,	Student is often able to identify an appropriate method for domain specific problems,	Student is able to identify the most basic, appropriate method for domain specific problems,	Student can sometimes identify the most basic, appropriate method for domain specific problems,	Student is unable to identify an appropriate method for domain specific problems.
Students will apply appropriate quantitative methods to formulate solutions to domain specific problems.	Student is consistently able to apply appropriate quantitative methods to formulate solutions to domain specific problems.	Student is often able to apply appropriate quantitative methods to formulate solutions to domain specific problems.	Student is able to apply the most basic quantitative methods to formulate solutions to domain specific problems.	Student is sometimes able to apply the most basic methods to formulate solutions to domain specific problems.	Student is unable to apply the appropriate methods to formulate solutions to domain specific problems.
Students will solve domain specific problems through quantitative reasoning.	Student is able, with a high degree of accuracy, to solve domain specific problems.	Student is able, with a relative degree of accuracy, to solve domain specific problems.	Student is able, with a relative degree of accuracy, to solve domain specific problems.	Student demonstrates limited ability to solve domain specific problems.	Student is unable to solve domain specific problems.