Hawai‘i Community College

**Foundations Course Designation Proposal**

**Application of Hallmarks Questions**

QUANTITATIVE REASONING (FQ):

Introduction: FQ courses should strive to impart an appreciation for the relevance and usefulness of quantitative reasoning. We define quantitative reasoning as the ability to apply mathematical concepts to the interpretation and analysis of quantifiable information, expressed numerically or graphically, in order to solve a wide range of problems, from those arising in pure and applied research to everyday issues and questions. It includes the ability to:

* recognize the limits of mathematical or statistical methods;
* understand and communicate quantitative information using such tools as variables and equations, graphs and charts, words/sentences;
* apply math skills;
* judge reasonableness of results.

The primary goal of FQ courses is to teach mathematical reasoning and tools at the college level. While additional course material (natural science, social science, etc.) can serve as a valuable context for learning these skills, it should not overshadow the primary goal.

To satisfy the FQ requirement, a course will:

**FQ Hallmarks are numbered with explanatory notes in italics. Questions you must answer in your application are in bold.**

1. Provide students with theoretical justifications for, and limitations of, mathematical or statistical methods, and the formulas, tools, or approaches used in the course.
2. **What mathematical or statistical formulas, tools, and/or approaches will be explored in the course?**
3. **How will the instructor introduce and reinforce the theoretical justifications for and limitations of these methods, formulas, tools, or approaches?**
4. Include application of abstract or theoretical ideas and information to the solution of practical quantitative reasoning problems arising in pure and applied research in specific disciplines, professional settings, and/or daily and civic life.
* *A minimum of 10% of course content (lecture content, homework problems, and exam problems) should include practical examples. Faculty members are encouraged to exceed this.*
* *Practical examples might involve a physical situation, professional application, or daily life. Faculty members are encouraged to situate some practical examples in a rich context.*
* *Practical examples should be integrated throughout the academic term.*
1. **Describe the course content and provide the amount of course time (number of hours) that integrates relevant problems and practical applications.**
2. **Provide sample activities, assignments/projects, and/or test questions that demonstrate the integration of relevant problems and practical application into the course.**
3. Provide opportunities for practice and feedback that are designed to help students evaluate and improve quantitative reasoning skills by including a course component at least once per week with a maximum 30:1 student-to-teacher ratio.
* *Examples of acceptable formats include, but are not limited to: small lectures with maximum enrollment of 30 students; large lectures with 30-student-maximum weekly recitation sections, discussion sections, or problem sessions led by trained graduate assistants or trained undergraduate peer-tutors; large lectures with weekly 30-student-maximum supervised computer lab sessions designed to reinforce and practice lecture material.*
* *Acceptable training for graduate students and undergraduate peer-tutors may include, but is not limited to, University and/or Departmental start-of-semester TA training, weekly course TA meetings, or other consistent guidance and supervision by faculty.*
1. **Describe the kinds of activities, assignments, and/or online resources that will provide opportunities to help students improve their quantitative reasoning skills on a weekly basis.**
2. **Describe the kinds of feedback that students will receive from the instructor, tutors, and/or teaching assistants, online tutorials, etc. on a weekly basis.**
3. Be designed so that students will be able to:
* identify and convert relevant quantitative information into various forms such as equations, graphs, diagrams, tables, and/or words;
* select appropriate techniques or formulas, and articulate and evaluate assumptions of the selected approaches;
* apply mathematical tools and perform calculations (including correct manipulation of formulas);
* make judgments, create logical arguments, and/or draw appropriate conclusions based on the quantitative analysis of data, the assumptions made, the limitations of the analysis, and/or the reasonableness of results;
* effectively communicate those results in a variety of appropriate formats.
* *Individual practical examples will likely emphasize some aspects of this hallmark while omitting others. However, the course as a whole must ultimately address each aspect of this Hallmark.*
* *Hallmark 4 is intended to help students identify the major components or factors involved in an analytical problem and determine the arrangement of evidence in evaluating the problem.*
1. **Where in the course will students demonstrate the five quantitative reasoning skills listed in this Hallmark? To address this question, please provide some examples or samples of assignments and model solutions/products that reflect all five skills.**