

TEACHING QUANTITATIVE COURSES

In a broad sense, a “quantitative course” is one in which mathematical or statistical analysis of quantitative data is a main component of the syllabus or the prerequisites for such a course. The three main issues are placement, technology and active learning.

PLACEMENT—STUDENT PREPARATION

When teaching such a course, it is essential to understand students’ preparation. High school students enroll at a public state university, like KU, with a wide range of quantitative backgrounds. The first step is to have clearly defined prerequisites for the course and enforce them. Even with enforced prerequisites, students will enter the course with a broad range of skills. The current teaching of mathematics in high schools varies from one school district to another and is different than what most instructors experienced (see NCTM standards reference in the sidebar at the right). It is not enough to require a passing grade in a high school college algebra course; scores on a national examination, e.g., math ACT, are a better determination of the required skills. Students should be held accountable for the necessary skills required for the course. Additional on-line supplementary material or handouts can be used to help students review the necessary skills without consuming class time.

TECHNOLOGY

Technology should be integrated in a quantitative course. From graphing calculators to Google spreadsheets, there are endless possibilities for using technology. Students use technology daily in many sophisticated venues. Incorporating technology in the course makes the content real and applicable and extends exploration in and outside the classroom. Additional resources (technical support and release time to develop or implement new material) need to be considered in those courses where technology has not been used before. If not carefully planned and tested, the technology component could result in a big loss of time and learning opportunities.

ACTIVE LEARNING

As in with any other subject, students learn better when they are engaged with the subject matter. Learning a new concept or methodology can be developed as a creative process. The students will learn to appreciate the possibilities and constraints of the discipline. Solving problems in small groups is still one of the most effective methods. Different approaches to the same problem should be encouraged and motivated. Students must learn the logical foundations of the subject to insure that they understand the critical certainty of their solutions.

SIDEBAR:

REFERENCES FOR TEACHING QUANTITATIVE CLASSES

Principles and standards for school mathematics from the National Council of Teachers in Mathematics: <http://standards.nctm.org/>

Mathematical Association of America quantitative literacy resources: <http://www.maa.org/ql/>

Mathematics Technology tools at Math Forum: <http://mathforum.org/mathtools>

Active learning in mathematics references:

http://www.cte.usf.edu/bibs/active_learn/math/bib_math.html