

Department of Astronomy and Astrophysics  
Guidelines for Q courses  
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Final Version

The following are the Astronomy Department's guidelines for the nature of the quantitative material in Q courses. These guidelines were worked out in conjunction with the Committee on Educational Policy in fall-winter 2005-6.

The campus standard for Q classes is given in Regulation 10.2.2.1.C, which defines a Q course as "One five-credit hour course or the equivalent that entails use of advanced algebra, statistics, or calculus.... The course may be offered by any unit but should teach, not just evaluate, mathematical skill."

To flesh out these very brief instructions, the Astronomy department adds the following:

1) Content: the three areas of math mentioned in the regulation contain several topics that are naturally relevant to astronomy classes, including logarithms, exponents, trigonometry, graphical analysis, statistics, and scaling relations. Quantitative questions should explore these concepts. More advanced astronomy classes will also utilize calculus and develop mathematical models for astrophysical phenomena.

In addition to the three areas of math mentioned in the regulation, quantitative astronomy questions also incorporate advanced geometrical reasoning, spherical geometry, and multi-step problem solving.

In all cases, questions should test students' understanding of what formulas mean, not just their ability to plug in numbers and solve. Rote manipulations should be avoided.

Catalog descriptions of Q classes should NOT say that no math on exams is required.

2) Testing: a significant component of evaluating students' skills will involve problems worked in class on quizzes and on exams. Homework assignments will also be acceptable as instruments of evaluation if used in moderation and if they contain clear instructions that the work must be the student's own. As a guideline, at least 25% of the point-content on exams should come from quantitative questions. Passing the quantitative

material separately is not required to pass the course.

3) Continuity: it is the Chair's responsibility to make sure that each new teacher of a Q course is familiar with these guidelines. Sample examinations and quizzes will be kept on file in the Department office for consultation by new teachers. Promulgation of these guidelines is a further method to ensure continuity.