MEMO

TO: GE Committee
FROM: Russell W. Howell
DATE: December 5, 2002
RE: GE Course Proposals

Our department has met to discuss courses suitable for inclusion in the new GE. The relevant courses are listed below along with a brief rationale. Attached are the syllabi for those courses. We are attempting to fulfill the Provost’s wishes to help get a suitable structure in place as soon as possible, but recognize you may want more information from us. If so, we will welcome your comments.

Common Inquiries

- Reasoning Abstractly
  - MA4 (Mathematics in Western Culture)
    As currently taught, the course forces students to engage in proofs of various geometric ideas, both in Euclidean and non-Euclidean geometry. It also looks at mathematical-philosophical abstractions, such as Zeno’s paradoxes and Gōdel’s incompleteness theorems.
  - MA5 (Introduction to Statistics)
    Whether this course qualifies for inclusion as one suitable for the abstract reasoning category is a close call. On the negative side, it does not engage in abstract proofs, though it does work with non-empirical ideas. The main arguments for inclusion are: (1) Not only does the course deal with the manipulation of data, but it talks about theories underlying such procedures; (2) The theories used apply themselves to application not just in one discipline, but in many disciplines. A practical consideration regarding the numbers of students that our department can service may (in the mind of the GE committee) tip the scales in favor of inclusion; our department would accept whatever decision is made.
  - MA7 (Finite Mathematics)
    Although taught at the same level as statistics, MA7 does engage in a modest amount of abstract arguments, and certainly works with non-empirical ideas.
  - MA 9, 9H, 10; 19 (Calculus I, IH, II; Multivariable Calculus)
    These courses present formal proofs to students, and students themselves must engage in a minimal amount of ‘loose’ proofs (i.e., not completely formal). They work extensively with abstract ideas (such as the derivative and integral) and apply them to solve both empirical and non-empirical problems.
  - MA20 (Linear Algebra)
    A required text for this course is Solow’s How to Read and Do Proofs. It is the first course offered in the major where there is a moderate (three or four lines) amount of proof required on the part of students. As with the calculus sequence, there is extensive work with abstract ideas, especially linear transformations.
  - MA160 (Fundamentals of Mathematics)
    Students are exposed to a fairly rigorous development of the real number system, with frequent exercises that demand the use of abstract thinking.
  - CS10, 20, 30 (Introductory Computer Science Sequence)
    The main emphasis on these courses are the study of the formal properties of data structures and algorithms, and the application of ideas of discrete mathematics to data structures and algorithms.