Core Curriculum Assessment
College of Arts and Sciences, 2007 - 2008

During the 2007 – 2008 academic year, the College of Arts and Sciences (COAS) initiated an assessment of all courses in the baccalaureate core that are offered by COAS. The College contributes courses to three core component areas: core component area 2 (mathematics), core component area 3 (natural sciences), and core component area 4 (visual and performing arts. This report focuses on core component area two. The courses and number of students assessed are listed below.

MTH 164, 199 (n=1130)

Assessment of Core Mathematics Courses

The Department of Mathematics and Statistics offers two standard courses for core curriculum purposes, MTH 164 College Mathematics and MTH 199 Mathematics for Managerial Decision Making I. When required by major, some students take MTH 142 Calculus I or MTH 184, 185 Introduction to the Foundations of Mathematics I, II as their core courses.

The MTH 184, 185 sequence is taken by elementary education majors and is regularly evaluated according National Council of Teachers of Mathematics (NCTM) standards through the University's regular NCATE accreditation process. Those taking MTH 142 are mathematics majors and some science majors. The number of students taking MTH 142 as their first core course is estimated at under 50 students annually. For these reasons, the core assessment process described here emphasizes the two most common courses MTH 164 and MTH 199. The assessment of these two courses is addressed below.

MTH 199 Mathematics for Managerial Decision Making I

In spring 2008, the Department of Mathematics and Statistics offered 11 sections of Mathematics for Managerial Decision Making I (MTH 199) to approximately 400 students. This course is a core curriculum course for students in majoring in business. The course is intended to prepare students for more general courses in business analysis. After consultation with faculty in the college of business in fall 2007, the curriculum was slightly revised, placing a stronger emphasis on exponential and logarithmic functions with a decreased emphasis on matrices.

During the last week of the spring semester, a seven question, common quiz designed to evaluate content knowledge at the end of the course was administered to 8 of the 11 sections of the course. The seven questions focused on main topics in the course, including simple interest (questions 1 & 2), compound interest (#3), simple substitution of a quantity into a formula (#4), recognizing an annuity type (#5) and recognizing the form of a quadratic function (#6) and using a logarithm to solve for an exponent (#7).

In the eight sections, 163 students took the 7-question quiz; the number of correct solutions was (114, 104, 85, 140, 74, 35, 43); the percentage of correct solutions was (70%, 64%, 52%, 86%, 45%, 21%, 26%). The most difficult concepts for the students were the last two problems, which required recognition of basic function types, in contrast to applications of set formulae. Still, a distressing number of students (less than 70%) applied a simple interest formula correctly.

Instructor comments consistently expressed concern about the lack of algebra preparation among the students. There is a consensus among instructors that the students' inability to perform basic algebraic skills (such as the inability to manipulate a simple interest equation) is the primary source of failure in this course.

As an initial remedy, the prerequisite for this class will be increased from a THEA (Texas Higher Education Assessment) algebra score of 250 to 270. Students who do not meet this prerequisite score must enroll in a remedial algebra course. Thus, the algebra background of the students enrolled should improve. Subsequently, the students' ability to grasp content ideas should not be impeded by the lack of algebra skills witnessed among current students.

MTH 164 College Mathematics

In spring 2008, the Department of Mathematics and Statistics offered 19 sections of MTH 164 College Mathematics to approximately 730 students. This course is a core curriculum course for most students who are not in a business or science major. The class is not an algebra class. It is intended to introduce students to the wide world of mathematics, following the philosophy of many "Math for Liberal Arts" classes. Although the curriculum is not well-defined and is left to the individual instructor, there is a common textbook and most of the sections in Spring '08 agreed on a core set of textbook chapters (focusing on sets, logic, counting and probability.)

During the last week of the spring semester, all 19 sections distributed a five question quiz designed to evaluate content knowledge at the end of the course. The five questions addressed set intersection, the truth value of a simple conjunction, the value of a permutation, a simple problem in probability, and the validity of a syllogism. These are critical concepts addressed in the common core of topics offered throughout all 19 sections of MTH 164. Of the 449 students answering this set of questions, the percentage of students with scores from 0 to 5 was (1%, 4, 11, 27, 30, 27). Most students had at least 4 of 5 problems correct.

Comments from instructors included concerns that many students did not have a basic "number sense," i.e., recognizing the meaning and size of various numbers and that the students relied on calculators for simple computations like multiplying single digit numbers, adding 2-digit numbers, multiplying a 2-digit number by 10, etc. In contrast, written comments on IDEA evaluation forms indicate that the philosophical nature of the course was attractive to some students who found the concepts and discussion stimulating. These students also indicated that they had previously found math "boring" or "meaningless."

The curriculum and nature of the course varied widely from instructor to instructor. A more coherent and consistent curriculum would be beneficial to the students.

In subsequent semesters, the prerequisite for this class will be increased from a THEA score of 250 to 270 and so the background of these students should improve. The department will also adopt a more uniform syllabus for the course. Some variability in topic selection will be allowed, but departmental outcomes for the course will be based on the common topics specified in the syllabus.