Mathematics Department Proposed Assessment Plan (2012 – 2017)

Mathematics Mission Statement
The mission of the Mathematics Department is twofold. Firstly, the Department provides a strong, broad-based preparation in mathematics and its related skills to enable students to select a variety of career paths in which the knowledge and intellectual skills of mathematics can be used. Secondly, we function as a service department to other programs on campus.

Mathematics Major Learning Objectives
The goals of the mathematics curriculum for the mathematics major will develop, in the student, competencies in analysis, algebra, probability and statistics, number theory, geometry, technology, and the history and applications of mathematics. It will also develop and enhance such relevant abilities as critical thinking, logical reasoning, problem solving, including intuition and rigor, modeling, and oral and written communication skills in mathematics.

The combination of the mathematics curriculum and the general education portion of the University curriculum is such that the career paths open to the student are broad and varied from teaching, actuarial science, statistics, graduate studies, and more.

In order to carry out its mission, the Mathematics Department strives to meet the needs of a diverse campus and student body through periodic assessment of its course and program offerings. The faculty is committed to developing and improving students’ problem solving and reasoning skills, as well as their mathematical knowledge, in order to prepare them to face the challenges of the twenty-first century. The department will continue to offer programs to meet the ever-changing needs of the students and the nation. Our continuing goal is the achievement of excellence and scholarship by all of our students.

Departmental Assessment
The Mathematics Department had its program review done in the academic year 2009-2010. The review included assessments such as the matching of courses with process learning objectives, an alumni survey, and a focus group of mathematics majors. Details of the department’s response to the recommendations of the reviewer are included in the assessment 5-year plan outlined below. The next departmental review is scheduled for 2015-2016.

In addition to assessing the learning outcomes of mathematics majors, the department has the responsibility of assessing the learning outcomes of students who are required to take 100-level courses as a part of their general education program and/or as a part of their major. The outcomes of general education courses are being assessed in spring 2013 as a part of the quantitative reasoning objective. The department faculty has been active in submitting artifacts for review and in developing and testing the rubric to be
used in the assessment project. The department is piloting a diagnostic test to evaluate the proficiency of students entering College Algebra with respect to the prerequisite satisfied by the student. The sample is small but the results can be used to refine the diagnostic test and revise the learning outcomes of the prerequisites and of College Algebra.

Program Assessment
The Mathematics Department serves students who are concentrating in one of three different areas of study:

- MAG (mathematics with a general option) majors are students preparing for a career in industry (for example, statistics, financial, actuarial) or for graduate school.
- MAT majors are students anticipating a career in teaching mathematics in a secondary school.
- MAE coordinate majors are students anticipating a career in teaching in an elementary or early childhood setting.

The programs were assessed as a part of the last program review and revisions to programs are outlined in the timeline below. The department curriculum committee has been particularly investigating the learning outcomes for students in the MAG program. Some assessments recently introduced into the MAT and MAE programs were created to match assessments with the NCTM learning objectives. Those students in the MAT and MAE concentrations are assessed by Massachusetts Teacher Educator Licensure exams and student teachers in these programs must satisfy the professional standards as listed in the state’s Preservice Preparation Assessment.

Course Assessment
Members of the department have developed a tool to assess the competency of students entering the College Algebra course. A pilot study is underway to compare the proficiency of College Algebra students based upon the assessment of their preparation (Accuplacer placement exam, courses at other colleges, or remedial courses). Information from the study will help the department to advise those involved in the preparation of students and advise those teaching College Algebra.

The department curriculum committee has decided to examine the learning outcomes of the courses leading to and through the calculus sequence. A goal is to improve transitions between the courses.

Year 1 (2012-2013)
Surveys of alumni (with regards to the outcomes of the major from their perspective) were distributed and are currently being analyzed. An outline for a capstone course for the MAG concentration is under consideration by the department curriculum committee. The course will provide another venue for assessment of the major.
Assessment documents were developed and used to measure the learning outcomes of students in the MAT program. Rubrics were written for the assessments (which were matched with the learning outcomes recommended by NCTM). The assignments provided by the students were assessed using rubrics. Results were stored in LiveText and reports were produced and analyzed.

A preliminary study of students’ preparation and success in entry-level courses is underway. A diagnostic assessment has been designed and is being piloted.

**Year 2 (2013-2014)**

The results of the alumni survey will be analyzed and recommendations will be proposed. Several recommendations of the program review including the change in programs needed to provide additional electives for students will be implemented. The department has developed several electives from which choices can be made. A capstone course for students in the MAG concentration will be designed and submitted to governance. Assessment tools will be developed that include rubrics. The development of rubrics for the assessment will help the department to develop other measures of student success.

Assessment documents for students in the MAT program will be revised and implemented. The SPA reports written as a part of application for NCATE accreditation received national recognition with conditions. Those reports will be resubmitted and additional data will be collected and analyzed.

Revisions in the course descriptions for courses in the calculus sequence (if needed) will be recommended. Assessments will be developed to evaluate learning outcomes.

The department will begin to develop assessment tools to use in assessing both the learning objectives for content and process for the major. The revisions in course descriptions will include the development of content student outcomes for the courses. During this year, the department will develop and pilot assessment tools for at least one of the process objectives. The assessment will be given to students at various stages in the program.

The study of students’ preparation for entry-level courses will be expanded. Additional institutional data will be used in the study and recommendations will be made and shared with stakeholders.

**Year 3 (2014 – 2015)**

The assessment tool for the learning objective identified in the previous year will be revised and continue to be used. The first results will provide the department with a snapshot of students’ performance at various levels. As the assessment is given over time, we will begin to see results longitudinally. Learning outcomes for courses in the Calculus sequence will be examined.
Assessment for the capstone course (offered in spring 2015) will be completed and administered. Any revisions in the course descriptions for the calculus sequence courses will be implemented. Results of assessments will be analyzed and assessments may be revised.

The assessment documents for the MAT program will be fully implemented. Results will be used to make changes in the program, if needed.

The assessment of incoming students as to their placement in math courses will continue to be examined.

**Year 4 (2015 – 2016)**
The department will continue to examine its offerings as to the needs of its students and revise its curriculum as needed. The assessments administered to students in the capstone course will be analyzed. Revisions may be made in the assessments and the rubrics after the results have been analyzed. The course descriptions and learning outcomes of courses other than those in the calculus sequence will be studied including the place of the courses in the core. Assessments will be developed for at least one additional process objective. Courses in the core of the mathematics major will be matched with both content and process standards.

**Year 5 (2016 – 2017)**
Combinations of the results of assessments and another program review will provide evidence as to the success of the implementations having been made. We will have results over years of some of the assessments and we can analyze trends in our majors. The department will continue to add and revise assessments as needed and make program changes as a result.