Memorandum

To: Academic Senate Review Committee
From: David Hunter, for the Mathematics and Computer Science Department
Date: January 22, 2007
Subject: Catalog changes for the Mathematics major

The Mathematics Department hereby proposes to replace MA 90 Seminar (1) with MA 180 Problem Solving Seminar (1, 1) in the Requirements for a Mathematics Major (for both the B.A. and the B.S. degrees). This change will add one unit to both the B.A. and the B.S. degrees, but will not change current levels of staffing. The proposed catalog changes are as follows.

1. In both the description of the B.A. and the B.S. degree, replace the section

   **Interdisciplinary Study: 1 unit**
   MA 90 Seminar (1)

   with the following section.

   **Problem Solving: 2 units**
   MA 180 Problem Solving Seminar (1, 1)

2. Update the unit count for the majors accordingly: the B.S. degree now requires 54 units while the B.A. degree requires 46 units.

3. Remove the description of MA 90 Seminar from the catalog.

4. Add the following description.

   **MA 180 Problem Solving Seminar** (1) Solve published problems from sources such as *The American Mathematical Monthly*, *Mathematics Magazine*, or *Math Horizons*, and submit solutions for publication. Fall semester students will also prepare for the Putnam examination, while spring semester students will assist in organizing the annual mathematics contest. May be repeated for credit.

5. In both the description of the B.A. and the B.S. degree, edit the section

   **Breadth: 12 units**
   *(Choose any 12 additional units chosen from upper-division mathematics courses or CS 135)*

   to read as follows.

   **Breadth: 12 units**
   *(Choose any 12 additional units chosen from upper-division mathematics courses or CS 135, excluding MA 180.)*
Rationale

The proposed course (MA 180) last appeared in the 2003–2004 catalog, and the above description is nearly identical to the old course description. The proposed change in our major restores a valuable feature of the major that last appeared in the 2002–2003 catalog. The Problem Solving Seminar helps develop critical and analytical thinking skills, highlights connections between upper-division topics, and strengthens the ability to investigate mathematical problems independently.\(^1\)

As a result of our departmental assessment discussions, a consensus emerged that the old Problem Solving course was an excellent source of externally reviewed student work products. A track record of published solutions to problems will help assess the departmental goal of developing students who can work independently and creatively in mathematics.

The NBS seminar will continue to expose our students to interdisciplinary perspectives. The department will explore ways to encourage participation in the seminar through existing courses. This approach will create opportunities to discuss connections between the seminar topics and the content of our mathematics and computer science courses.

Prior to 2003, Problem Solving was a 2 or 3 hour requirement of our major, depending on the track. Since we no longer have tracks in the major, the current proposal requires 2 units of Problem Solving of all majors. The department believes that it is important for students to take Problem Solving more than once, because it provides a tangible measure of how their mathematical skills improve after taking upper-division classes. Some students may elect to take Problem Solving more than two times, especially those bound for graduate school.

Administrative Considerations

Since the proposed change replaces all sections of MA 90 with MA 180, it will have no effect on levels of staffing. Although MA 90 will no longer be offered, current mathematics majors may substitute 1 unit of MA 180 for the 1 unit of MA 90 required in the 2003–2004 through 2006–2007 catalogs. The proposed change is for the 2007–2008 catalog.

\(^1\)The attached syllabus, from Fall 2003, expands on the objectives of this course.