

# Program Review Progress Report—Annual Update

Mathematics and Computer Science Department

September 15, 2007

Since our last update report of June 2006, we have shifted the focus of the program goals for the department of Mathematics and Computer Science. After several discussions within the department and also with faculty from other departments, we have developed the following four goals.

1. **Core Knowledge.** Demonstrate knowledge of the main concepts, skills, and facts of the discipline.
2. **Communication.** Be able to communicate ideas from the discipline following the standard conventions of writing or speaking in the discipline.
3. **Creativity.** Demonstrate ability to formulate and attack a novel problem.
4. **Christian Connection.** Know how to incorporate their discipline-specific skills and knowledge into their thinking about their vocations as followers of Christ.

These goals more clearly and concisely articulate our view of the mission of the department. While we believe this mission is consonant with the six college-wide learning standards, we feel a greater sense of ownership of the above four goals. Furthermore, we expect that these goals will lend themselves better to assessment through evaluation of empirical data.

The remainder of this progress report details how we have applied these goals in the past year. For each goal, we explain how we have collected and interpreted data, how this process has led us to make changes in our program, and what steps we plan to take in the future. Since we have only recently articulated these new goals, this report is short on data and long on future plans. We hope that these plans will lead to a sustainable and meaningful program of assessment for the department.

# 1 Core Knowledge

Students will demonstrate knowledge of the main concepts, skills, and facts of the discipline.

**Assessment:** All majors will take the Major Field Test in their junior or senior year.

**Benchmark:** 50% of students will score above the 25th percentile on the Major Field Test.

The Educational Testing Service's major field test in mathematics includes topics from almost all of the courses we offer: MA 9, 10, 15, 19, 20, 40, 108, 110, 121, 123, 130, 136, and 140. Similarly, the major field test in computer science covers topics from MA-15 and CS 10, 30, 45, 105, 116, 120, 125, 130, 135, 140, and 145.

## 1.1 Data

We plan to administer the Major Field Test for the first time in Spring of 2008.

While majors who pursue teaching credentials must pass certain state-mandated field tests, the data from these students is not representative. However, of the two mathematics graduates currently pursuing credentials, one (Megan Argabright) passed the state-mandated field test this year, and another (Kimberly Wong) was told that she didn't need to take the field test for her certification program at CSU Northridge because her Westmont coursework was so strong.

## 1.2 Interpretation of the Results

N/A

## 1.3 Using the Results

N/A

## 1.4 Next Steps

In Fall 2007, the department will decide on a mechanism to ensure that all majors complete the major field test in their junior or senior year. Ideally a student will take the test in the senior year, although in some circumstances a student will have to take the exam as a junior. This test could possibly be bundled with one of the capstone courses.

Once this mechanism is in place, the department chair will order the MFT and selected faculty will administer it to the appropriate students in Spring 2008.

## 2 Communication

Students will be able to communicate ideas from the discipline following the standard conventions of writing or speaking in the discipline.

**Assessment:** In those courses identified as writing-intensive (CS 130, MA 108, MA 110, MA 136), writing samples will be gathered from each student at three points in the semester: within the first two weeks, at midterm, and during the last two weeks. These writing samples will be reviewed using the department rubric and the over-all level of writing in each paper rated as deficient, emerging, or developed.

### **Benchmarks:**

1. 90% of the students will evidence improved writing skills over the course of the semester.
2. Either the number of papers rated “developed” will double from the start to the end of the term or over 50% of the final papers will exhibit ”developed” writing skills.

### **2.1 Data**

We are currently in the process of collecting this data (in MA-136, Fall 2007, and in CS-130 and MA-110, Spring 2007).

### **2.2 Interpretation of the Results**

N/A

### **2.3 Using the Results**

N/A

### **2.4 Next Steps**

During this academic year, the department will meet to develop and refine the rubric. We will meet in May 2008 to apply the rubric to the collected writing samples.

## 3 Creativity

Students will demonstrate ability to formulate and attack a novel problem.

### Assessment:

1. All mathematics majors will take the Problem Solving course (MA 180) in which they will attempt to solve novel problems found in mathematics journals such as *The American Mathematical Monthly*, *The College Mathematics Journal*, *Math Horizons*, and *Mathematics Magazine*.
2. Qualified mathematics and computer science majors will participate in undergraduate research projects.

### Benchmarks:

1. Before graduation, 10% of all mathematics majors will have produced a correct solution to a problem from a journal (as arbitrated by the journal).
2. Before graduation, 25% of mathematics and computer science majors will complete some form of summative work stemming from a research project (e.g., poster, paper, or presentation).

### 3.1 Data

During the summer of 2007, four computer science students participated in research projects. Some CS students have had papers accepted by peer-reviewed journals and have presented posters on their research. Problem Solving (MA 180) has just been reinstated for fall 2007, so data will be available by 2008.

### 3.2 Interpretation of the Results

The department is active in undergraduate research in computer science, but less active in mathematics.

### 3.3 Using the Results

As a result of our deliberation on assessing this learning goal, we decided to replace Seminar (MA 90) with Problem Solving (MA 180) for the mathematics major. We are also considering whether to increase the credit units for MA 180 from 1 to 2.

### 3.4 Next Steps

Collect data on MA 180 during Fall 2007, and discuss if we are satisfied with our benchmarks.

## 4 Christian Connection

Students will know how to incorporate their discipline-specific skills and knowledge into their thinking about their vocations as followers of Christ.

**Assessment:** Students in capstone courses (MA 136, MA 140, MA 155, CS 195) will write a short paper reflecting on the integration of faith and learning.

**Benchmark:** To be determined.

### 4.1 Data

We plan to implement this reflective paper for the first time in Spring 2008.

### 4.2 Interpretation of the Results

N/A

### 4.3 Using the Results

For the past few years, the department has been hosting a retreat to discuss issues of faith and vocation in the context of our academic program. Developing and assessing this learning goal has helped motivate the content of the departmental retreat.

### 4.4 Next Steps

In Fall 2007, we will decide on a mechanism and format for the reflective paper. In Spring 2008, we will design a rubric for evaluating these papers, and set appropriate benchmarks. In May 2008, we will apply this rubric to the first sample of reflective papers.