

## **WASC Road Map for Math Dept Assessment**

### **MA Math/MS Math Goals 6-7 are to be assessed.**

Looking at MA/MS graduates we see that roughly 85% have gone on to careers as teachers at high schools (10%), community colleges (60%), and universities (15%). The remaining 15% have gone on to careers in business, government, and industry. Overall the Math Department Assessment Plan for the MA/MS Math programs is in the developed stage. The students in the MA/MS Math programs are required to take a variety of upper division and graduate classes including 12-18 units of graduate courses and one two semester graduate sequence. They are asked to develop an area of specialty and pass a specialist qualifying exam covering the materials from two upper division math courses in this area. At this time the Math Dept. has a reasonable multi-year program planning/assessment plan. The Math Department would also need to publicize these learning objectives that students are expected to learn in course outlines, green sheets and on the Math Department web page to reach the highly developed stage.

### **A. The Comprehensive List**

Given the flexibility of the MA/MS Math program and the many areas of mathematics that students have written theses in Goals 6-7 seems to form a reasonable comprehensive list of objectives. Students need to exhibit their depth of knowledge in one area of mathematics by first passing a specialist qualifying exam and then completing a thesis/writing project in their area of specialization and then defending this thesis to their committee. To reach the highly developed level in this area the department would also need to discuss and agree upon explicit criteria for assessing students' level of mastery of each learning outcome at future Math Dept meetings. We would hope to have this done and reach the highly developed level for this criterion by the end of Spring 2013.

### **B. Assessable Outcomes**

All learning outcomes described in Goals 6-7 can be assessed in the agreed upon places, the specialist qualifying exam and the thesis/writing project defense. In some cases there is no agreed upon rubric that has been approved by the department for evaluating the level of student performance. This can be discussed at future department meetings. Presently this decision on how to evaluate student performance for each goal is left up to the faculty members on the student's committee. At this point the Math Dept Assessment Plan is developed but not highly developed in this area. We would hope to have rubrics discussed and agreed upon and reach the highly developed level for this criterion by the end of Spring 2013.

### **C. Alignment**

The MA/MS Math curriculum is generally well aligned with Goals 6-7 and students have many courses in which to increase their performance for each of the goals though again there are some areas where improvement is possible. The Math department might want to consider adding additional upper division courses where students will be expected to write projects and give oral presentations to give students more chances to enhance their communication skills (Goal 2). For example, this could be done during the second course of a two-semester sequence that each student is required to take. Presently the Math Dept is developed but not highly developed in this area though again we can probably be at the highly developed level for this criterion by the end of Spring 2013.

### **D. Assessment Planning**

At this time the Math Dept. has a reasonable multi-year program planning/assessment plan. Our last external review took place in Spring 2009 and our program planning meeting with the provost was held in Fall 2010. In Spring 2011 Goal 6 and 7 were assessed. The assessment data is gathered by the faculty members on the thesis defense committees. The data is then reviewed by the Graduate Curriculum committee and the Math Dept. chair to determine if any changes are needed in the curriculum or in the assessment plan itself and always we are looking for the points of strengths and signs

of weaknesses in the curriculum and how to improve the delivery of the material in order to increase student learning. Any proposed changes are presented to the math department faculty for discussion and a vote at a department meeting. Presently the UCC is discussing potential changes to Goal 6 and the way in which it is assessed. It was last reviewed using data gathered at the thesis defense but we have decided to assess this goal at the required specialist qualifying exam. The department assessment planning presently is developed but not highly developed. It should be possible to reach the highly developed level for this criterion by Spring 2013.

### **E. The Student Experience**

The department student experience is at the developed level. Most courses have clear learning outcomes spelled out in details and students know about them but more needs to be done in this area and we intend to do this in the near future and communicate to the students all learning outcomes by advertising them on the mathematics web page and by making clear to the faculty that discussing the learning outcomes with the student should be thought of as an important component of the courses. The Math Department would need to publicize these learning objectives that students are expected to learn in course outlines, green sheets and on the Math Department web page to reach the highly developed stage. To give students some say on the assessment plan the department might want to consider giving out a survey to students who are about ready to graduate and solicit their opinions on how well the department achieved its stated goals in educating the students. For example this data could be obtained by thesis advisors when students have completed their thesis defense. It will probably take some time to do this but we hope to have this completed by end of Fall 2013.

### **MS Statistics**

The MS Statistics program just started in Fall 2011 so the Assessment Plan for this program is in the initial stage. The MS Statistics program is has received the official designation as a Professional Science Masters by the Council of Graduate Schools. The links below give some curriculum guidelines for Professional Science Masters programs.

<http://www.siam.org/students/resources/guidelines.php>

[http://www.sciencemasters.com/portals/0/pdfs/Guidelines\\_for\\_PSM\\_Affiliation\\_Revised.pdf](http://www.sciencemasters.com/portals/0/pdfs/Guidelines_for_PSM_Affiliation_Revised.pdf)

<http://www.sciencemasters.com/>

<http://www.cgsnet.org/>

The SIAM (Society for Industrial and Applied Mathematics) curriculum guidelines for a Professional Science Masters program suggest that the following skills are the most important for a student to learn, 1) modeling, 2) teamwork, 3) computation, 4) interdisciplinary, and 5) communication. The curriculum of the MS Statistics is closely aligned with these goals and students are able to take many courses where they would learn or enhance these skills. Statistical and mathematical modeling is important in most of the required statistics courses for this program, including Math 163, 203, 261A, 261B, 265, 266, and 269. Teamwork is a skill that would be learned and practiced in Math 203 and Math 269. Students will be using statistical software in most of their statistics courses, but computation skills are certainly the main focus in Math 167 and Math 267. Students in the MS Statistics program are encouraged to take one or more electives where they learn about applications of statistics to another field like Biology, Business, Economics, Engineering, Health Science, Psychology, and others. Students are expected to write reports and give oral presentations in various courses like Math 203 and Math 269 and they are also expected to complete a thesis or writing project. We would like to develop an assessment plan for the MS Statistics program by Spring 2013.