

## 2005-06 Planning and Review Committee

### Consultant Recommendation

**I. Degree:** B.S. in Applied Mathematics and Computer Science

**Date of Review:** February, 2006

**Program Director:** Diane Christie

**PRC Consultant(s):** Nancy Schofield and Diane Klemme

**Purpose of the Review:** To assess the quality of the B.S. degree program in Applied Mathematics and Computer Science as part of a seven-year review cycle required of all UW-Stout degree programs.

**Committee Findings:** The Planning and Review Committee recommends continuation of the Applied Mathematics and Computer Science program for the following seven years and implementation of committee recommendations.

**II. Abstract:**

The Applied Mathematics and Computer Science program offers a strong foundation in academic math and students can specialize in either statistical or computer analysis. The Applied Mathematics and Computer Science program has an outstanding placement rate and Applied Mathematics and Computer Science graduates' starting salaries rank as some of the highest of all UW-Stout undergraduate programs. The program is highly regarded and there is a continued strong demand for its graduates.

Since 1998, the time of the last PRC review, the program enrollment and female enrollment in the program has declined, however this reflects the national trend. The number of concentrations was reduced from thirteen to three and then a fourth concentration in bioinformatics was added in 2004. The program now offers students four areas of concentration: a) actuarial sciences, b) bioinformatics, c) business management, and d) software development. Program faculty are pursuing a grant proposal to review the viability of adding a concentration in information assurance and cyber security.

Program concerns include staffing issues, enrollment decrease, and software/hardware availability and compatibility.

**III. Process Followed for Current Review:**

The PRC consultants discussed the program review process with the program director and the chair of the Department of Mathematics, Statistics, and Computer Science. The PRC consultants met again with the program director to discuss issues of concern for the program review report. On February 24, 2006, the program director, department chair, and the dean of CAS met with the PRC to present and discuss the program review report. This report was approved at the April 7, 2006 meeting.

**IV. Previous Review:**

<b>1998 Recommendation</b>	<b>1998 Response</b>	<b>Current Status in 2006</b>
A. Continue efforts to seek adequate lab and staffing resources.	The program director reports that, with current enrollment, no additional faculty or staff are required; however, if enrollments continue to increase, additional staff will be needed. Computer lab concerns are a chronic problem. Though facilities have been updated since the 1991 PRC review, this program must keep current with rapidly changing technology. Current needs follow: 1) the PC Lab (HH 208) needs updating to at least the Pentium level; 2) the number of lab stations needs to be increased and updating of all lab facilities is required.	The laptop requirement has dramatically improved the access to updated technology hardware however, hardware and software continues to be updated.  Staffing turnover is a concern.
B. Review number of concentrations in the program.	While the number of concentrations has been regularly reviewed, none have been eliminated. The program director concedes that some of the concentrations are not well used or relevant and might be eliminated. However, he points out, they do occasionally prove useful to transfer students who wish to pursue the major but present what is for Stout an unusual record of earned credits.	Fourteen concentrations have been eliminated and <b>Bioinformatics</b> concentration has been added. Currently there are four concentrations. Program faculty are reviewing the possibility of adding a fifth concentration – information assurance and cyber security.
C. Promote Applied Math and Computer Science with School Relations Office in recruiting students interested in Math/Computer Science.	The Office of Admissions currently manages School Relations; the program cooperates with Admissions recruitment efforts. The primary recruitment tools are the annual Stout Applied Mathematics Conference, conducted by the department and the program, and through high school recruiting visits.	Program enrollment has declined, as have the number of females in the program which follows national trend of decline.  Recruitment activities are needed even more.
D. Direct attention to further develop communication skills of students.	The program director reports that the extensive co-op/internship program allows students to apply classroom skills and gain confidence in communicating with people in the workplace. The group projects in the capstone Math Models course challenge students to communicate their analytic and problem-solving skills.	Group projects in the Math Models course have continued. It is not clear that computer science students are adequately served by this course.

**V. Program Review:**

<b>Program Strengths</b>	<b>Source</b>
1. Program director	Key instructor survey and PRC consultants observation
2. Currently 100% of Applied Math graduates are placed in jobs related to their studies.	Program director's report and summary of undergraduate degrees

<b>Program Strengths</b>	<b>Source</b>
3. Faculty expertise and accessibility are frequently cited as program strengths. Faculty backgrounds include relevant work experiences in the field and faculty continue to keep up-to-date in their areas of expertise.	PRC student survey and key instructor survey
4. Combination of math, statistics and computer science gives students a strong foundation.	Program director's report; student survey; program committee survey and key instructor survey
5. Positive relationships with business and industry provide opportunities for student co-ops, internships, and jobs; these opportunities further enable the program to help students connect classroom training with workplace problems and social situations.	Program director report; student survey; program committee survey; and key instructor survey
6. Class size provides good teacher-student interaction.	PRC student survey
7. Co-op/intern experiences provide valuable hands-on experiences.	Program director's report
8. Advisory committee includes an increasing number of business and industry professionals.	Program director's report

<b>Issues of Concern</b>	<b>Source</b>
1. "Lack of options for a student who does not like the math (or conversely, the computer science) side of the major since a great deal of each are required for all concentrations."	Quote from program director's report and PRC student survey
2. There is a lack of consistent staffing. The program has experienced a high turnover in computer sciences instructors.	Program director's report
3. Declining enrollments	Program director's report
4. Retention of students	Key instructor survey
5. The percentage of women is no longer above that of similar American programs.	Program director's report
6. Scheduling concerns, especially courses that are not offered frequently enough.	Program director's report and student survey
7. Continuing need for up-to-date hardware and software to support courses.	Program director's report
8. Concern that the programming concentration is not being served by the current capstone course.	Student survey and discussion with program director
9. Faculty with expertise in Bioinformatics is needed for new concentration.	Program director's report

### **Recommendations for the Program Director**

1. Work with the advisory committee to increase flexibility in the program to address the student concerns about taking "too many" courses outside their concentration. When advertising the program clearly states that coursework covers both mathematics and computer science.
2. Seek recruiting opportunities to increase overall enrollment and female enrollment in the program.

3. Continue efforts to address the dynamic software and hardware needs of the program.
4. There is a need for students in all concentrations to apply knowledge in the work environment. Explore the possibility of providing a capstone experience for each concentration or ensure that the Math Models courses are serving all students.

**Recommendations for the Chair of the Mathematics, Statistics and Computer Science Department**

1. Work with the dean to address continuing staffing concerns.
2. Work with the dean to provide increased support for recruiting and retention efforts for both faculty and students.
3. Recruit and hire faculty with expertise in Bioinformatics for the new concentration.
4. Examine scheduling concerns, especially courses that are not offered frequently enough.
5. Continue to address ongoing hardware and software needs. Solicit faculty input in decision making and share with the dean.

**Recommendations for the Dean of the College of Arts and Sciences**

1. Work with the chair to address continuing staffing issues.
2. Provide increased support and funding for recruiting and retention efforts for both faculty and students.
3. Continue to address ongoing hardware and software needs. Solicit faculty input in decision making.