

Program Assessment Report (PAR) on Completed Assessment

Year 1 [2014/2015] ~ Program: _____Biomathematics_____

1. Which set of PLOs was assessed this academic year (identify each PLO)?

1. Read, write and communicate mathematics effectively
2. Use computing tools in modeling or problem solving

2. Describe the assessment activities below. Please provide enough detail to convey the nature of the activities.

For assessing “Read, write and communicate mathematics effectively” the capstone course MATH 463 Topics in Biomathematics was key. In this course, students are asked to do projects that culminate in an oral presentation and a written manuscript. The details for the requirements for the project are laid out in the course syllabus for MATH 463 and in a set of project guidelines provided to the students of MATH 463.

Likewise, for “Use computing tools in modeling or problem solving” MATH 463 Topics in Biomathematics was key. The final project in MATH 463 again plays a key role since this provides a means to assess the ability of students to make use of computing tools in modeling or problem solving in a broad and synthesized way.

3. What were the results of the assessment activities?

The final project papers and presentations in MATH 463 topics in biomathematics show that students in the biomathematics program can read, write and communicate mathematics effectively. Spring 2015 marks the third consecutive year that capstone course final projects have been used as a key assessment tool. Comparison across the three years shows a clear consistency in student performance with regard to PLO: can read, write and communicate mathematics effectively. However, after participation in the January 2015 assessment workshop, some minor changes were made to the final project requirements for MATH 463 in Spring 2015. It is likely that the project requirements will continue to be modified over future semesters in order to improve student performance and assessment with regard to the PLO: can read, write and communicate mathematics effectively. Finally, it should be noted that Spring 2016 will be the first semester in which it is possible for students enrolled in MATH 463 to have participated in the new foundations level *eloquentia perfecta* (EP) incorporated into the freshman biology lab course. Since freshman biology lab is required for biomathematics majors, it will be interesting to see if there is any change in student performance with regard to PLO: can read, write and communicate mathematics effectively as a result of the new EP foundations requirements.

As mentioned, the final projects for MATH 463 also provide insight into student performance with regard to the PLO: use computing tools in modeling or problem solving. Since a major aspect of the final project is for students to construct or exhibit significant independent understanding of a mathematical model(s), the expectation is that use of computing tools will play a significant role. Judging from the final projects in Spring 2015, and indeed since Spring 2013, it is clear that the biomathematics students make use of, and appreciate the importance of the use of computing tools in modeling or problem solving. In particular, most students make some use of the software MATLAB, which is a standard tool in mathematics and

scientific computing. However, it is also clear that students are not generally making use of computing tools to their fullest potential.

4. Where applicable, outline the steps you will take to make improvements to the program based on the results of assessment activities identified in #3.

With regard to the PLO: read write and communicate mathematics effectively, in the future, it would be beneficial for students to receive detailed feedback on their mathematical writing and communication in multiple stages. For example, students could be asked to hand in multiple drafts for feedback, or student could be asked to write and/or communicate their project proposals in a formal manner in which feedback can be provided that will help to improve performance with regard to this PLO.

With regard to the PLO: use computing tools in modeling or problem solving, it could be beneficial for students to have dedicated computing assignments. Typically, students are only asked to perform computing exercises alongside paper and pencil exercises. As such, it could be perceived by the students that the computing tools serve only as a check, or supplement to paper and pencil exercises; and not as an independently important part of modeling or problem solving. In addition, there is currently no unified approach to teaching the use of computing tools across the biomathematics curriculum, that is, the degree to which computing tools are used and the choice of computing tools varies across courses and even across instructors for a given course.

5. Are there any new resources needed to make program improvements? If so, please include the resources and provide justification for each in the Budget section of the Annual Report.

A dedicated mathematics computing lab fully supported by IT with a sufficient number of relevant programs/licenses installed.