Annual Assessment Report

Department: Mathematics and Computer Science
Academic Year: 2022-2023
Date of Submission: 9/14/23
Department Chair: Anna Aboud

I. Response to the previous year PRC's recommendations

Item: Please use the PRC annual report template when preparing your next annual report.	**Response: Addressed.**
Item: Please give an update on your current Multi-Year Plan following your recent six-year assessment report.	**Response: See attached file.**
Item: Are there any early indications that more female students are taking CS-10 as a result of the new computational biology component?	**Response: There are actually fewer women enrolled in CS-10 this fall than last fall (22% women in F23 versus 36% women F22). We feel that it is too early to determine whether the increased focus on computational biology connections is making an impact. 23-24 is also the first year that Biology is offering a Genomics and Bioinformatics Track within their major. This major track requires at least CS-10 and CS-30 (the intro CS sequence) and it will be interesting to see if this attracts more women to both these courses and also potentially the CS major/minor.**
Item: What steps are being taken to attract a more racially or ethnically diverse student population?	**Response: We are working with admissions to connect more intentionally with prospective students, particularly those coming from the Santa Barbara area and from programs such as PEAC AVID, REACH, and Mission Scholars. Specifically, last year we worked with Araceli Espinosa to send a department representative to speak with these students on visit days as well as setting up a class visit time to enable these students to attend a CS course.**
Notes:	

II A. Program Learning Outcome (PLO) assessment

If your department participated in the ILO assessment you may use this section to report on your student learning in relation to the assessed ILO. The assessment data can be requested from the Dean of Curriculum and Educational Effectiveness.

Program Learning Outcome	NA
Who is in Charge /Involved?	
Direct Assessment Methods	
Indirect Assessment Methods	
Major Findings	
Closing the Loop Activities	
Collaboration and Communication	

or/and

II B. Key Questions

Key Question	What modifications need to be made to the computer science and mathematics curriculum, and how can we attract/retain a diverse group of students, provide enhanced internship opportunities, and build community?
Who is in Charge/Involved?	In the 22-23 school year, the Math/CS department undertook two main curriculum projects: a restructuring of the CS curriculum (both majors and minor) and the development of an Applied Math minor. **Project 1:** The department chair (Anna Aboud) was in charge; the entire Math/CS department was heavily involved. **Project 2:** Maryke van der Walt developed the minor, soliciting and receiving feedback from all Math/CS department members.
Direct Assessment Methods	**NA**
Indirect Assessment Methods	**NA**
Major Findings	**Project 1 - CS Curriculum Restructuring:** The department was aware that such a revamp was due, but we were waiting until after we were able to hire a new faculty member (Guang Song in S22!) to restructure in a manner aligned to the strengths and interests of our CS faculty. In the Fall of 2022 we devoted portions of over ten department meetings to this project (see the Math/CS department meeting minutes from F23). We first brainstormed holistically, having discussions about the interests and strengths of our current faculty, changes within the discipline (what is considered essential for a CS degree now is different than what was considered essential 15 years ago!), and the needs, strengths, and interests of our student body. We referenced the information gathered in our recent 6-year report heavily, along with the recommendations from our external reviewer. Many of these recommendation were informed by the desire to attract and retain a diverse student body. Although we only have two full time CS faculty members, the entire department was activity involved and invested in this discussion as most of us teach courses which are cross-listed Math/CS and all of us advise students from the Data Analytics (which is over 1/3 CS courses) and Computer Science majors. Over the following weeks we used this discussion to inform specific and significant curriculum changes. A comprehensive list of these changes (including the rationale for each) is included on the attached document "CS Curriculum Changes with Rationale." We emailed changes not requiring Faculty Senate Approval to Michelle Hardley in F22. In S23, the

| | department chair presented the larger proposed changes to Faculty Senate, where all were approved. In F23-S23 the department will revise and finalize an updated course schedule based on the new needs of the updated curriculum.

Project 2 – Applied Math Minor
Maryke van der Walt developed an applied math minor in F22-S23. This was in response to suggestions made by our external reviewer and the department in our 6-year report. This minor should help attract a more diverse student body to our department as well as create added synergy with the Physics and Engineering department. Maryke used the information in our 6-year reports and also gathered new information about applied math minors at peer and aspirational institutions. She presented this information to us at a department meeting in F23 and received feedback and suggestions from all department members. After integrating this information, Maryke presented the new minor to Faculty Senate, where it was approved. |
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| **Recommendations** | |
| **Collaboration and Communication:** Entire department; department meetings | |

Key Question	**Is the department giving sufficient attention to the QAR and RA aspects of the courses it is teaching?**
Who is in Charge/Involved?	The department chair (Anna Aboud) was in charge; the entire Math/CS department gave feedback.
Direct Assessment Methods	NA
Indirect Assessment Methods	NA
Major Findings	The department chair (Anna Aboud) was the lead assessment specialist for the QAR/QL GELO/ILO last year. She worked in consultation with the Math/CS department faculty during department meetings to choose and implement a new assessment tool which assesses Quantitative Reasoning through writing. This led to many fruitful conversations about which of our QAR courses provide practice/training in this implementation of Quantitative Reasoning. We also talked about the development of Quantitative Literacy in writing across our major curriculum.
Recommendations	We concluded that we should be offering our majors significantly more writing-related projects in many of our upper division courses. We intend to revisit this conversation after reflecting on the results of the QAR/QL assessment from S23 and make a curriculum map marking the classes in which such assignments are given.

Collaboration and Communication: Entire department; department meetings

III. Follow-ups

Program Learning Outcome or Key Question	
Who was involved in implementation?	
What was decided or addressed?	
How were the recommendations implemented?	
Collaboration and Communication	

IV. Other assessment or Key Questions related projects

Project	Reasoning Abstractly GE

Who is in Charge /Involved?	
Major Findings	Data was collected from several of our RA courses in the F21-S22 academic year as part of the RA GELO project. In our F22-S23 department meetings, the Math/CS faculty reflected on the RA assessment report. The department did not determine any major action points as a result. The department also revisited the RA certification criteria and discussed the interpretation/meaning of each portion of the criteria and where we see this being implemented in various mathematics courses.
Action	NA
Collaboration and Communication: Entire department; department meetings	

V. **Adjustments to the Multi-year Assessment Plan (optional)**

Proposed adjustment	Rationale	Timing

VI. Appendices
   A. Prompts or instruments used to collect the data
   B. Rubrics used to evaluate the data
   C. Relevant assessment-related documents (optional)