Assessment Report for the 2020-21 Academic Year

Department of Mathematics and Computer Science

Chair: Chris Camfield, Associate Professor of Mathematics

The department met on Tuesday, May 4th for our year end assessment meeting.

Part I: Program Assessment

In our Assessment Plan, 2020-21 is the year to examine Mathematics Learning Goal 1, Computer Science Learning Goal 1, and Computer Science Learning Goal 7.

We would like to point out that we collected data for every learning goal this year, not just those being assessed. In future years, we will have multiple years of data on hand when assessing those goals. The data is currently stored in a spreadsheet with a tab for each department learning goal. At some point, we will design a database for this data, but the spreadsheet will do for now.

MLG1: Employ the methodologies used in mathematics, including calculation, proof, discovery of new mathematics, and application.

For direct assessment of this goal, instructors rated each student's performance in relation to this learning goal. For indirect assessment of this goal, a question was included in the course feedback survey. Data was collected for both semesters.

- A total of 343 students across 19 MATH courses were rated according to the following distribution:
    - 94 – Strong
    - 148 – Satisfactory
    - 62 – Needs Growth
    - 38 – Unsatisfactory
    - 1 – Not Applicable
- The initial observation here is that 71% of students are performing at satisfactory level or better. This is a number we would certainly like to be higher.
- When asked about their perception of meeting this goal, 192 students across 16 MATH courses responded according to the following distribution:
    - 115 – Strongly Agree
    - 63 – Agree
    - 12 – Neutral
    - 1 – Disagree
    - 1 – Strongly Disagree
- Students responded favorably to this at a much higher rate than the faculty opinion of their performance. However, response rate was low, so there is likely a selection bias here.
- The 2020-21 Academic Year was an unusual year due to remote instruction. We worry that remote instruction allowed students to over rely on internet resources to the detriment of their skill development. It seemed that first-year students arrived less prepared and developed bad habits in the fall.

- The mathematics faculty are discussing changes to some of the Calculus lab assignments to devote more time in the classroom for supervised problem solving so that we can increase growth of essential skills.
- In some classes, late policies for homework had unintended consequences. Due to increased stress levels for students and the year being unusual, some classes took a more flexible approach to due dates. The hope was that students would be able to work at a natural pace them while providing flexibility when it was needed for other classes. This resulted in some students falling way behind and trying to catch up in the last week. We will be looking which classes need more of that structure back to keep students on pace.
- We did not receive data for Keely Grossnickle's six courses before she left for a new job.

CSLG1: Create and demonstrate software that correctly solves realistic problems with open-ended scope.

For direct assessment of this goal, instructors rated each student's performance in relation to this learning goal. For indirect assessment of this goal, a question was included in the course feedback survey. Data was collected for both semesters.

- A total of 176 students across 9 CSCI courses were rated according to the following distribution:
  - 105 – Strong
  - 34 – Satisfactory
  - 24 – Needs Growth
  - 12 – Unsatisfactory
  - 1 – Not Applicable
- The initial observation here is that 79% of students are performing at satisfactory level or better.
- When asked about their perception of meeting this goal, 152 students across 11 CSCI courses responded according to the following distribution:
  - 96 – Strongly Agree
  - 33 – Agree
  - 6 – Neutral
  - 1 – Disagree
  - 6 – Strongly Disagree
- Students responded favorably at a similar rate to the faculty opinion of their performance.
- The 6 students who responded with "Strongly Disagree" were all from fall semester sections of CSCI 150. This certainly reflects the challenges of remotely teaching an introductory technical course.
- We will continue to give attention to timely feedback. As with the mathematics courses, we will reflect on the appropriate levels of flexibility for students regarding homework.

CSLG7: As part of a team, develop robust software artifacts that successfully enable their users to achieve their goals.

This learning goal is only assessed in three courses. Two of those courses, Mobile Software Development and Interactive Game Development, were taught this academic year. For direct assessment of this goal, instructors rated each student's performance in relation to this learning goal. For indirect assessment of this goal, a question was included in the course feedback survey. Data was collected for both semesters.

- A total of 43 students across 2 CSCI courses were rated according to the following distribution:
  - o 25 – Strong
  - o 14 – Satisfactory
  - o 3 – Needs Growth
  - o 1 – Unsatisfactory
  - o 0 – Not Applicable
- The initial observation here is that 91% of students are performing at satisfactory level or better.
- When asked about their perception of meeting this goal, 33 students across 2 CSCI courses responded according to the following distribution:
  - o 19 – Strongly Agree
  - o 13 – Agree
  - o 1 – Neutral
  - o 0 – Disagree
  - o 0 – Strongly Disagree
- Students responded favorably at a similar rate to the faculty opinion of their performance.
- Being able to work as a team to successfully develop robust software is a critical learning goal for students as they prepare for a career in computer science. This data suggests we are doing well here. We will continue to look for relevant projects and new opportunities for students to develop in this way and to showcase their work.

Part II: To-Do List for 2021-22

Due to the unusual nature of the 2020-21 academic year, some items on this list are carried over from last year.

- Each year, develop detailed rubrics for assessing that year's learning goals.
- Resolve some inconsistencies across documents about which courses are relevant for each learning goal.
- For courses that are required for majors outside our department, inquire about what assessment is needed for those programs. These courses include MATH 130, MATH 140, MATH 215, and MATH 260.
- We introduced new lab assignments in the Calculus sequence this year. The mathematics faculty have already begun discussing adjustments for next year with a focus on student workload, effective use of class time, and grading burden.
- We are welcoming a new mathematics professor to our department next year. We will make sure she is familiar with learning goals before a semester begins. Some of us learned early in our career that it can be hard to accomplish learning goals that you are not aware of.

- In response to national trends, we will be looking into the role of Calculus in the computer science program.