UNIVERSITY OF SAN FRANCISCO | College of Arts and Sciences

<Computer Science/Master's of Science and Bridge>

ASSESSMENT REPORT
ACADEMIC YEAR 2021 – 2022

I. LOGISTICS

1. **Please indicate the name and email of the program contact person to whom feedback should be sent (usually Chair, Program Director, or Faculty Assessment Coordinator).**

   EJ Jung, ejung2@usfca.edu, Faculty Assessment Coordinator of CS dept.

2. Please indicate if you are submitting report for (a) a Major, (b) a Minor, (c) an aggregate report for a Major & Minor (in which case, each should be explained in a separate paragraph as in this template), (d) a Graduate or (e) a Certificate Program

(d) Graduate, both Master's program and Bridge Program.

3. Please note that a Curricular Map should accompany every assessment report. Has there been any revisions to the Curricular Map?

No changes were made. The curricular map is attached.

II. MISSION STATEMENT & PROGRAM LEARNING OUTCOMES

1. Were any changes made to the program mission statement since the last assessment cycle in October 2020? Kindly state "Yes" or "No." Please provide the current mission statement below. If you are submitting an aggregate report, please provide the current mission statements of both the major and the minor program

No changes were made.

The mission of the MS in Computer Science graduate program is:

To provide students a strong theoretical background in computer science and deep technical programming skills by focusing on one-on-one student interaction and fostering the unique capabilities of each student.

Our mission statement coincides with the university mission to give students the knowledge and skills needed to succeed as professionals, and we are sensitive to the needs of our extremely diverse student population.

2. **Were any changes made to the program learning outcomes (PLOs) since the last assessment cycle in October 2020? Kindly state "Yes" or "No." Please provide the current PLOs below. If you are submitting an aggregate report, please provide the current PLOs for both the major and the minor programs.**

No changes were made.

Master's Program PLO

Students who graduate with a MS in Computer Science will be able to:

- Demonstrate advanced knowledge in a breadth of topics in computer science, including theory, systems, and development.
- Master at least one area of specialization in computer science. Demonstrate ability to independently solve advanced problems in academia or industry.
- Demonstrate ability to independently solve advanced problems in academia or industry.
- Demonstrate the ability to develop, learn and apply state-of-the-art technologies in computer science.

Bridge Program PLO

Students who pass the bridge program and proceed to the MS in Computer Science will be able to:

- Application: Implement medium- and large-scale programs in a variety of programming languages
- Theory: Explain and analyze standard computer science algorithms
- Systems: Describe the interactions between low-level hardware, operating systems, and applications

3. State the particular Program Learning Outcome(s) you assessed for the academic year 2021-2022.

MSCS Program

Demonstrate advanced knowledge in a breadth of topics in computer science, including **theory**, systems, and development.

Bridge Program

- **Theory**: Explain and analyze standard computer science algorithms

III. METHODOLOGY

Describe the methodology that you used to assess the PLO(s).

Among the breadth of topics in Computer Science, we focused on theory this academic year. We use CS 603 (was 673 in Fall 2021) Algorithms taught in Fall 2021. CS 603 is a prerequisite for subsequent core courses in Master's program, and provides a comprehensive overview of advanced theories in Computer Science.

The faculty instructors evaluate student's learning outcome via direct methods. In their assignments and exams, students solve new problems using advanced theories and standard computer science algorithms, directly demonstrating their learning outcome. The assignments are graded by TAs using the rubric created by the teaching team. The exams were written and graded by the instructor.

All rubrics were created based on the key points students needed to demonstrate via using or explaining in the advanced theories. For example, when the problem expects 3 key findings, the problem was given 6 points so that students who demonstrated the full mastery get 2 points, those who demonstrated a partial mastery get 1 point, and the rest get 0.

IV. RESULTS & MAJOR FINDINGS

What are the major takeaways from your assessment exercise?

Level	MSCS Students	Bridge Students
Complete Mastery of the outcome	72.5% (29/40)	93% (13/14)
Mastered the outcome in most parts	20% (8/40)	7% (1/14)
Mastered some parts of the outcome		
Did not master the outcome at the level intended	7.5% (3/40)	

Results (Graduate):

Majority of students (29 out of 40) were able to show complete mastery of this learning outcome. 8 students were able to master the outcome in most parts, which is the level of learning outcome required to proceed to the next set of core courses in Master's program. There were 3 students who didn't master the outcome – 1 student withdrew from the program and 2 students stopped coming to classes in November. Both the graduate program director and I reached out to these students many times, and students decided that the program was not the right fit for them.

The assignment scores ranged from 86.6~107.4% including extra credits, and they were higher than the exam scores (66.9~94.4%). Since the topic of this course is standard theories in Computer Science, students can find many other resources on the Web, such as YouTube. When students were taking the exam, they were allowed to bring any

number of notes, but the Internet was not allowed. It is possible that students are getting too much help from the Internet on the assignment.

In Fall 2022, the instructor modified the assignments to include more original questions so that students won't be able to find too much help in the Internet. Also, the previous exam questions were provided for students to practice. The overall exam score range was improved.

Among 40 Master's students who took CS 603 in Fall 2021, 14 students were in the Bridge program in AY 2020-2021. Most of them, 13 out 14 students achieved the complete mastery, and only 1 student achieved the mastery in most parts. We are happy to see how strong our Bridge students are performing in the graduate program.

V. CLOSING THE LOOP

1. Based on your results, what changes/modifications are you planning in order to achieve the desired level of mastery in the assessed learning outcome? This section could also address more long-term planning that your department/program is considering and does not require that any changes need to be implemented in the next academic year itself.

Both MSCS and Bridge programs' assessment were positive and the feedback is shared with the department chair and the instructors. We will revisit the feedback when we evaluate the same PLO next time.

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