ASSESSMENT REPORT REMOTE/DISTANCE LEARNING
ACADEMIC YEAR 2019 – 2020

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, Faculty Assessment Coordinator ejung2@usfca.edu

    Alark Joshi, Chair, ajoshi@usfca.edu

2. **Please indicate if you are submitting report for (a) a Major, (b) a Minor, (c) an aggregate report for a Major and Minor (in which case, each should be explained in a separate paragraph as in this template), (d) a Graduate or (e) a Certificate Program.**
    Please also indicate which report format are you submitting –Standard Report or Reflections Document

    Aggregate, Reflection Document

3. **Have there been any revisions to the Curricular Map in 2019-2020 academic year? If there has been a change, please submit the new/revised Curricular Map document.**

    No

II. MISSION STATEMENT & PROGRAM LEARNING OUTCOMES

1. **Were any changes made to the program mission statement since the last assessment cycle in October 2019? 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.**

Mission Statement (Major): Students who graduate with a Bachelor of Science (B.S.) degree in Computer Science will be prepared for both graduate school and for software development careers. The curriculum provides a solid base in computer science fundamentals that includes software design and development, problem solving and debugging, theoretical and mathematical foundations, computer systems, and system software.

Mission Statement (Minor): The knowledge of computing and programing is widely applicable and complementary to many majors at USF. The Computer Science minor is designed to provide students with problem solving skills in computer science to advance in their own majors and professional opportunities beyond their graduation.

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 diverse student population from all majors and programs at USF.

3. **Were any changes made to the program learning outcomes (PLOs) since the last assessment cycle in October 2019? 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

PLOs (Major/Graduate/Certificate):

*   THEORY: Explain and analyze standard computer science algorithms and describe and analyze theoretical aspects of various programming languages.
*   APPLICATION: Apply problem-solving skills to implement medium- and large-scale programs in a variety of programming languages.
*   SYSTEMS: Describe the interactions between low-level hardware, operating systems, and applications.
*   PROJECT: Demonstrate effective communication and organization as part of a team of software developers or researchers collaborating on a large computer program.

PLOs (Minor):

Students who complete the requirements for Computer Science minor will be able to:

- Implement a simple program in two programming languages
- Implement an intermediate-size program in one programming language
- Depending on the student's choices in electives,
    - Demonstrate a mathematical background for computing
    - Demonstrate programming in a third programming language and describe the interactions between applications and the underlying systems
    - Explain and analyze standard computer science algorithms
    - Demonstrate using CS problem solving skills in other disciplines

III. REMOTE/DISTANCE LEARNING

1. What elements of the program were adaptable to a remote/distance learning environment?

Lectures and one-on-one meetings were most adaptable in Computer Science programs. Computer Science faculty met once a week starting Summer 2020 under the leadership of the department chair Alark Joshi to share the ideas and plans on moving the lectures and labs into the first fully remote/distance learning semester in Fall 2020. Many CS faculty used two devices for zoom lectures for three purposes: monitoring students, projecting the screen, and providing the white-board experience using annotation. Many purchased extra hardware and software to create a better experience for students, ranging from a screen annotation application to a new iPad pro.

CS faculty used a similar set-up for one-on-one meetings, such as office hour visits and interactive grading sessions.

2. **What elements of the program were not adaptable to a remote/distance learning environment?**

The most difficult element was the assessment using exams. Computer Science discipline has been fighting with a rampant cheating problem nationwide, if not globally, even reported by New York Times in 2017. Cheating in CS assignments is easy (copy and paste is all it takes) and industrialized – a few CS faculty found their assignments and solutions on a membership-based website. Students who did the assignment can post their solutions to the website to get paid, and others can pay for the membership to the website to download the solution. CS faculty adopted many tools to manage the cheating problem – reminding students that they are here to learn, changing the assignments every semester, using the software to compare submissions, and revising syllabus to include "regret clause" and also severe punishment for repeated offense. While many of these were adaptable to a remote/distance learning environment, exams were not.

Computer Science students are very likely to have two devices connected to the Internet at any given time, laptop for their work and a smart phone for their social lives. ITS/ETS provided Respondus Lockdown browser, which was helpful, it was not designed with the students with multiple devices. I led a discussion in the class with students on this topic. I explained the goal of the exams is a fair assessment of their learning outcome, and asked for their ideas on how to implement an inclusive exam environment. Students admitted that it was relatively easy to cheat by using a second device that is not locked down, and also noted that there was no way to distinguish students going to a restroom during the exam vs. using a device in a different room to cheat. Students also noted that recording them during the entire exam duration could be a privacy issue for their roommates and family members.

A few faculty members had suspicions that some students in their classes cheated using the second devices, but didn't have a concrete evidence beyond the unusual similarity in their answers.

3. **What was the average proportion of synchronous versus asynchronous learning for your program or parts thereof? A rough estimate would suffice.**

Out of 46 sections provided in Fall 2020, 5 sections were asynchronous. In Spring 2020, all CS classes were synchronous.

4. **For what aspects of learning is synchronous instruction effective and for which ones is asynchronous instruction more effective?**

To answer this question, I surveyed CS faculty and CS students. 19 faculty members and 47 students responded. In both synchronous and asynchronous courses, students liked the lecture videos. Some liked to re-watch them and some liked the flexibility in schedule. In Synchronous courses, both faculty and students enjoyed 1) sharing screens of faculty and students, and 2) asking and answering questions privately in chats and breakout rooms. Since there not many asynchronous sections, only 6 faculty members and 37 students responded Asynchronous course-related questions. Faculty liked that asynchronous format allowed them to prepare materials at their own pace (67%) and the logistics of finding a quiet time and space were easier (50%). Students like that they could watch the lecture videos at their own pace (54%) and the logistics were easier (24%).

Both faculty and students with families at home may benefit from choosing Asynchronous format, and also those with less reliable Internet could benefit similarly.

5. **As remote/distance learning continues in the current environment, what changes has the program instituted based on experiences with remote instruction?**

In an open-ended question in the survey, students recognized and appreciated that the CS department is doing its best, and some even commented that CS courses were better organized than other programs'. However, students are looking for more connections. Most students (79% of the students in Synchronous courses and 70% of those in Asynchronous courses) was how they did not feel connected to their classmates, and the number 2 (58% and 57%) was how they did not feel connected to their instructors.

The department organized more social events, such as Halloween celebration in Fall, such as Women in Tech and also Game Developer Club. 2020, and also encouraged students to get engaged in student-led clubs. The department also continues to offer tutoring center to support students.