April 27, 2021

TO: Remzi Arpacci-Dusseau, Professor and Chair, Computer Sciences

FROM: Eric M. Wilcots, Interim Dean


CC: Jenna Alsteen, Graduate School
Kristin Eschenfelder, Associate Director, L&S Division of Computer, Data, and Information Sciences
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On March 2, 2021, the L&S Academic Planning Council discussed the materials submitted for the review of the MS-Computer Sciences, named option “Professional Program” (known, colloquially, as the “Professional Masters Program” or PMP). Associate Dean Kristin Eschenfelder led the council’s discussion, and as expected, we learned that the program generally seems to be performing well, is on solid financial footing, and students are satisfied with it.

In consideration of students’ learning, we and the APC encourage the department to continue and to expand the use of assessment data collection to understand better the student experience and student achievement in the PMP; this is particularly important for students completing the degree. Ideally, the program would use existing systems upon which to build new methods to collect data the program finds useful for improvement.

In terms of diversity, the ongoing challenge for CS is to identify and implement strategies to grow the number of students of color in the PMP applicant pool. We suggest consultation with
experts in the Graduate School and use of the extensive CS alumni network to begin to develop a recruiting network. The program has shown progress in gender diversity, increasing female applicants and percent of women in the enrolled student. The self-study suggests that the department will further this through setting of admissions goals and attract more women through diversification of its faculty and staff.

Several suggestions raised in the report were discussed further by the L&S Academic Planning Council:

- The report described how some students felt they did not have relationships with faculty advisors, whose advice about course selection is intended to complement the advice they receive about meeting program requirements. The L&S APC agreed that all students should have a faculty advisor who is accessible and able to provide this course advice. They encouraged CS to reorganize program advising to better meet these goals, perhaps by making more use of group advising by interest area or other systematic arrangements.

- The report also drew out the need for more career advising, which CS faculty identified as a need. The L&S APC agreed that faculty members are probably not fully prepared or well-positioned to offer advice about career preparation and placement. They encouraged CS to consider adding post-baccalaureate career services capacity using program revenue, perhaps through a cooperative arrangement within the School of Computer, Data, and Information Science, and in consultation (or, if possible) cooperation with L&S SuccessWorks.

- The report drew attention to some students’ perception that the curriculum was overly theoretical and did not offer sufficient applied coursework for a “professional” program. The review committee recognized the tension between students’ requests for more applied or practical courses and a more research-oriented or theoretical curriculum. The APC discussed this and strongly encourages CS to continue to work to meet the needs of PMP students by adapting coursework to incorporate more applied work, which seems to distinguish the program from GPR-funded CS programs in the traditional curriculum.

Although the APC did not require that you provide a formal report on your efforts to take action to increase program diversity, increase student connections with faculty, or enhance access to career advising, I look forward to learning more about what you will do in these dimensions and what impact your actions will have. I and my colleagues in L&S Administration note that this non-pooled revenue program enjoys the benefit that status. For example, the program can work with DCS to recruit a more diverse pool of applicants. The Department can and should address curricular needs and expand student services to better align with the demands of its audience by increasing enrollment to fund that expansion. Please reach out to Associate Dean Kristin Eschenfelder for guidance on the nature and timing of the update you should provide.

The review report encouraged CS to try to build a mechanism to provide information about future likely course offerings so students could better plan their programs of study. Finally, the report encouraged CS to continue work on strengthening community for PMP students so that
they feel more engaged with the department and with program alumni. The review committee offered a number of other suggestions, some of which might be considered in consultation with colleagues in CDIS, in L&S Administration or the Graduate School, particularly where program development or revision may be a factor.

In sum, the council agreed, on the whole, with the review committee’s conclusion that the PMP is functioning well and the department is managing it appropriately. I am happy to report that the L&S APC unanimously approved a motion to consider the L&S portion of this review complete. The next phase of review will involve discussion by the Graduate Faculty Executive Committee, which may offer advice from its perspective.

While the purview of the L&S APC does not include financial and budget matters, this review also provides an opportunity for the College to consider the financial performance of the program. Recognizing that PMP has a very competitive admissions rate, it appears the program has considerable potential to expand enrollment. The department seems to feel that the program cannot increase enrollment without sacrificing the quality of the student experience and limiting access to desired courses. The 131 budget model was intentionally designed to eliminate the tension between these objectives, as the additional revenue from increased enrollment could be used to cover the additional expenses while also increasing the department’s surplus. Indeed, expansion of 131 programs is crucial for the department to achieve its long-run aspirations, allowing it to expand well beyond what would be possible if it tried to rely entirely on 101 funding.

We wish you, your colleagues, and students continued success in your work.
A summary of the activities of the review committee and materials reviewed

L&S Dean Eric Wilcots charged the committee to complete the first five-year review of the MS in Computer Science Professional Program Named Option. The analysis and report were prepared by the committee.

The committee received the following documents:

- Charge from Dean Eric Wilcots.
- The self-study prepared by the program faculty and staff.
- An overview of the five-year review process: https://kb.wisc.edu/apir/97507
- Resources supporting program review (https://kb.wisc.edu/apir/97289)
• Institutional and program data available in Tableau visualizations (https://dataviz.wisc.edu/#/projects/8 and https://search.data.wisc.edu/radar.php)

The committee met (via Zoom) on October 27 for roughly an hour to review and discuss the charge, analyze the self-study and set up a plan for verifying facts and obtaining information from CS administration, faculty, and students.

The Review Committee met (via Zoom) with three faculty and staff affiliated with the PMP from 11 AM to 12 PM on Thursday, December 10, 2020:

• Janna Boehm (Professional Programs Coordinator);

• Stephen J. Wright (Amar and Balinder Sohi Professor of Computer Sciences); and

• Suman Banerjee (Sheldon B. Lubar Professor of Computer Sciences).

Wright is one of 3 faculty members supporting the program. Janna Boehm serves as coordinator dedicated to both the PMP and its precursor Certificate Program. Boehm developed a short list of 18 interested first- and second-year students to compose a focus group; these were encouraged to invite other students.

The resulting student focus group was held (via Zoom) from 1-2 PM on Monday, January 4, 2021. There were 6 final student participants: 3 first-year, 2 second-year and 1 very recent (December) graduate. Identities of participating students will be left anonymous in this report, and the meeting was not recorded, in order to ensure candid and confidential conversation.
An evaluation of the strengths and weaknesses of the program

The Computer Science Professional Master’s Program (PMP) is set up to allow working professionals to earn an M.S. degree in two years. The PMP courses are typically taught in face-to-face format, with the necessary migration online due to COVID in 2020. PMP students have access to the full range of courses offered by the Department. The Professional Certification Program is designed in part to serve as a gateway for those students who choose to apply up to 14 credits from the Certification towards their Professional Master’s. PMP students also earn an MS in Computer Science. The PMP degree is a terminal one, and students wishing to continue on for their doctorate must apply separately to the traditional MS/PhD program.

Strengths

The Department self-study states of its PMP students that “we make a point of treating the same as students in our traditional program in all respects. …We have not compromised on the quality of the education received by PMP students.” The PMP is a popular program, attracting over 600 applications for 2020-2021. One faculty member describes it as “at a good steady state” in which the principal limitation is teaching capacity, since there is great demand and strain on graduate courses. He continued to say that the parity between Professional and Traditional program curricula had a salutary effect on the students: “Our PMP is very similar to the regular program. While it may look odd, our PMP students completely and seriously appreciate it. They feel they are getting a very high quality education and therefore the minimal difference between the two programs is a strength: students are motivated and positive.”

Program Coordinator Janna Boehm reports that for Fall 2021, 112 people have already submitted applications and another 411 have applications in progress. This is more applications than seen in December 2019. Every year, there are more certificate program graduates applying to the PMP; in 2020, 75%

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1 Suman Banerjee, CS faculty/staff interview, December 2020.
were admitted.\textsuperscript{2} Generally, the program has been hitting its targets for proportion of offers and acceptances. The COVID pandemic has naturally had a depressing effect on applications; most accepted students admitted for Fall have deferred entry for 1-2 semesters, and this has downstream implications for admissions from the next round of applications in February and March 2021.\textsuperscript{3}

Faculty members interviewed report on the high academic quality of PMP students. When the program was first launched, one concern was that because the bar for admission to the PMP is academically lower than for the traditional master’s, and applicant GPAs are not as high, coursework would have to be correspondingly changed to meet the needs of this cohort. In fact, this has not happened and PMP students are, in general, doing as well as the traditional master’s program students, which faculty have discussed quite a bit.\textsuperscript{4}

The six students from whom this Committee sought feedback are in uniform agreement on the quality of the coursework and faculty, describing their instructors as “knowledgeable, very responsive” and saying they are “very happy with professors.” First- and second-year students alike told us they were “very satisfied” with their programs; one first-year student with an interest in research specified that his research experience had also been very good, which was a bonus he wasn’t expecting. Another first-year student emphasized her gratitude “for the existence of the program … [she was] very grateful that it was an avenue where she could continue to study without that being her sole commitment” and that she was “very happy this program exists at the UW. It will bring in students with interesting backgrounds and career development”.\textsuperscript{5} It is the conclusion of this committee that for the most part, the students in the PMP are very happy.

\textsuperscript{2} Janna Boehm, CS faculty/staff interview, December 2020.
\textsuperscript{3} Steven Wright, CS faculty/staff interview, December 2020.
\textsuperscript{4} Ibid.
\textsuperscript{5} PMP student focus group, January 2021.
Weaknesses

The PMP has some challenges, in which this committee finds varying degrees of agreement between faculty, staff and students.

Students expressed their desire for what they called more practical education, as opposed to theoretical: “There is a general machine learning class and a theoretical machine learning class,” one second-year student complained, “but nothing about how to do that in practice. That was missing.” Specifically, there was no programming component on how to apply the knowledge acquired. A first-year student agreed, saying that while almost all classes had a “strong theoretical side to them,” not many were practical. This student would like to see more courses focused on best programming practices, admitting that this “might not be in the ethos of the department, but for a professional program, would be helpful.” Another first-year student expressed an interest in “a practical class for those whose main objective is to go into industry…Content targeting what you do for jobs would be helpful.” This speaks to the essential difference between the Professional Master’s and the Traditional Master’s Program: the PMP is set up to meet the needs of working professionals, but those curricular needs will differ. But students in this focus group do not perceive that these differences are reflected in the coursework.

Both groups of stakeholders described advising as a weakness of the program. This was evident in the program’s Self-Study report. Student exit surveys in Fall 2018 and Spring 2019 revealed dissatisfaction with this aspect of the program, with approximately 30% of respondents indicating it fell below their expectations. However, the CS faculty we interviewed identified career advising as a particular challenge. Both Professors Wright and Banerjee expressed that specific career services advising was something the program needs, but was currently not feasible.

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6 PMP focus group, op. cit.
7 Ibid.
8 Ibid.
due to faculty and staff resource limitations. Curiously, that was not a big concern for the students--one was even surprised about getting help with an internship!

Conversely, the students in the focus group almost uniformly identified academic advising as a particular area of weakness. The problem of choosing courses was a dominant theme in our focus group conversation. All participants had very positive things to say about Ms. Boehm in her role as coordinator – “She’s very responsive, provides a lot of information that is helpful!” but understand that she is not the appropriate person to ask which courses to select. One first-year student was careful to stress that while both Ms. Boehm and his instructors had a “very fast response” to his curricular questions, nobody else did – “pretty nonexistent advising” when he would have “appreciated a sit-down with his advisor to discuss what courses to take.” A second-year student agreed that she had had the same experience, saying that she contacted her advisor twice during her program, and then “gave up.” The downstream effect of this on students was made clear by a different student in the group, who specified that she “doesn’t feel uncomfortable reaching out [to her advisor]. We just have no relationship. They probably wouldn’t even know who I was unless I cold-emailed them.” These comments stand in contrast to the opinions expressed by both faculty we interviewed, that “Very rarely do [students] seek advice. … If they were more proactive, things would change.”

Additional challenges around coursework centered on unavailability of information; no course forecast is available to permit students to make longer-range choices, not just about which courses to take but about the sequence and future availability of prerequisite courses. In the context of the advisor communication problem described above, students feel themselves in an information vacuum: as one first-year student put it, “[I’m] not

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10 PMP focus group, op. cit.
11 Ibid.
sure it’s feasible to plan a course of study if you don’t know what’s going to be available”\textsuperscript{13} and another first-year student agreed, saying “It’s hard to figure out what to take this semester to fit requirements down the road.”\textsuperscript{14}

The final weakness identified by the six students in our focus group relates to the departmental culture. While several described their professors as “friendly and approachable”\textsuperscript{15}, they also found it difficult to become engaged with the CS department as a whole and the PMP program specifically, saying they felt a lack of connection. This was a theme we heard from both first- and second-year students. Students were careful to acknowledge that the move online due to COVID naturally had an impact on this. A first-year student commented that “Some informal meetups have happened. Online fatigue makes it less likely for her to participate.”\textsuperscript{16} A second-year student pointed out that some work to “make it a more friendly atmosphere” was needed – “Even before the pandemic, could have used some help with that.”\textsuperscript{17} Another first-year student mentioned that this weakness related to the gap in career services – students “could use the opportunity to network with past graduates who have already graduated and are working at the companies you want to join. Opportunities to network with people at these companies would be helpful.”\textsuperscript{18} Only one student mentioned the CS departmental online meetups on Fridays – “somewhat helpful in meeting other students”\textsuperscript{19} – which raises the possibility of a lack of awareness of what opportunities exist for students to connect with their peers.

\textsuperscript{13} PMP focus group, \textit{op. cit.}
\textsuperscript{14} Ibid.
\textsuperscript{15} Ibid.
\textsuperscript{16} Ibid.
\textsuperscript{17} Ibid.
\textsuperscript{18} Ibid.
\textsuperscript{19} Ibid.
Recommendations for future directions

This Committee has some suggestions for the CS Department to consider based on its own departmental experiences. First, academic advising is clearly broken – this is something the Department needs to address with its faculty, using whatever incentives are available to ensure that students have a connection with an advisor. Second, career advising services, while not as great an area of concern for students, were mentioned as a weakness by the CS faculty we interviewed. Third, aspects of Departmental culture seem to pose an impediment to some students – increasing ways for students to network with each other will help address the previous two concerns simply by filling the present informational vacuum. Fourth, provision of sample course schedules for a “generic 4-semester” schedule, with several possible foci, would help students. Forecasts can be disseminated with the understanding that some courses might not run in a particular semester. These could be modified to meet individual students’ needs and with the understanding that some courses may not run in a given semester. Fifth, connecting current students with former students for networking would help current students both academically and careerwise.