

UNIVERSITY of WISCONSIN
GREEN BAY

Date: May 13, 2013

To: Peter Breznay
Chair, Computer Science

From: Scott Furlong
Dean of Liberal Arts and Sciences



Re: Report on the Computer Science Program Review

The Computer Science program at the University of Wisconsin-Green Bay offers two emphases, one disciplinary and the other interdisciplinary. The primary distinction between the two is that the interdisciplinary emphasis has a different structure within their requirements (adding a “mathematical application” and a “theoretical foundation” requirement), and primarily requiring more math courses within the curriculum. The program is currently experiencing some difficulty due to turnover within the faculty over the past few years. One of these positions (previously held by Bill Shay) was moved to the Communications program in order to address more immediate and continued enrollment issues. Recent resignations caused openings in two other positions this year, and there is currently an attempt to address this. The program review raises a number of concerns and possible futures for the program. The AAC addresses some of these as part of their review.

Enrollment Trends/Resource Issues:

As noted in the program review majors in the Computer Science program here at UW-Green Bay tend to be cyclical. The program, over the past five years, has had majors as low as 80 and as high as 109, which is a high for the past five years. By this measure, the program is healthy in that it has a good number of majors and the short term trends suggest an uptick. One concern that I have raised over the past few years with the program is that while the number of majors is healthy, there are not subsequent numbers of graduates. In essence, there would appear to be an attrition and retention concern within the program (the 2011/12 academic year did have a health number of majors at 17). According to the program review, the faculty do not see this attrition rate as a “cause of concern” but “rather it is a badge of honor.” While I can appreciate the need to maintain rigor in order to ensure quality, there is also a role for faculty to help move students through the stages of development within their programs and perhaps work with the tutoring center or develop some programs of supplemental instruction to address this. The other enrollment issue raised during the last review concerned number and percent of female majors in the program. The national trend is that this program tends to be a male dominated major. This number has been in the 90% range at UW-Green Bay. As noted in the program’s review, analysis of this issue by Institutional Research show that the attrition rate for females that had done well in the supporting courses is higher than it is for males. This potentially suggests a concern that would be the basis for additional research and possible action by the program.

The enrollment trends lead to concerns for upper level courses. I have had a number of occasions where I have had to raise the issue of low enrollments in the upper level computer science curriculum. This has not been an issue over the past year or so and possibly reflects changes in the curriculum and/or improvements in student retention (we don't have the data yet to know for sure).

The program has had to be somewhat nimble in the recent past due first to the retirement of one faculty member (position moved to another area), and the recent resignations of a faculty and full time lecturer. This has created stresses on the program as it works to offer its curriculum and find adequate ad hocs to staff courses. The program recently had a failed faculty search, but is hopeful that a full time lecturer can be hired in the near term.

Learning Outcomes/Assessment:

The learning outcomes for the Computer Science program are the same as the previous program review. Assessment methods have in the past included alumni surveys, evaluation of internships, a capstone essay, and embedded assessments. According to the self-study, the use of embedded assessment has been discontinued. The alumni surveys are an indirect measure, but do still have merit. Depending on the type of information gathered by the internship and capstone essay, these could be useful direct assessment measures. At this point, it is unclear from the self-study how the data being collected ties back to the program's learning outcomes. The self-study notes that one measure of the success of the program is 100% employment in high-paying positions for their graduates. This is an important accomplishment, but there is some concern with the low number of respondents for this data (N=8). The program states in their self-study that they intend to wait until the new university assessment plan is implemented before developing a new plan.

With the completion of the University Assessment Plan, I expect the program to follow up and work toward a workable assessment plan next year.

Curriculum Development/General Education:

Given the nature of the field there are often changes made to specific courses within the computer science curriculum. In addition, there have been some broader changes regarding moving classes to inactive status, changing periodicity, and the like.

The Computer Science curriculum currently does not have any courses offered through general education although the faculty in the program often teach INFO SCI 201 class, a very popular an NPS 2 class. The self-study discuss a possible interest in developing new courses such as "Overview of Computing" that could serve as both general education classes as well as different ways for student to access the major.

Responding to the AAC Report and Concerns and the Future:

The AAC program review recommends that the Computer Science program "should receive faculty development funds to assist them in maintaining their knowledge in their field." The self-study also made a comment about not having funding for these efforts. My understanding is that the faculty do receive funding for faculty development efforts from the unit. In addition, since I

have been dean one of the Computer Science faculty members was granted a sabbatical, and another would be on sabbatical in the coming year if he did not resign. So, some funding and support is provided for these efforts. Whether additional funding is warranted for this field compared to others that require keeping up to date in their field is an issue that will require additional thought.

The self-study notes the following options for the future of the Computer Science program depending on staffing issues:

- Eliminate the major and offer only minor or alternatively a computational studies program. This option is not supported by the current faculty and they believe would not be good for the campus or NEW region that needs computer scientists;
- Continue to offer the existing program with some small changes and adjustments to the existing curriculum including potential courses for general education;
- Expanding the number of tracks within the CS program. This would likely require additional staffing and also working with other programs on campus.

Both the self-study and the AAC report notes the possible collaboration with the Information Sciences program with the AAC calling them “natural partners.” There is also mention of collaborations with other programs around campus such as Design Arts, Theatre, and the recent interest in digital humanities. There may be some opportunities to take advantage of the interdisciplinary nature of the campus to pursue such collaborations and examine how the computer science discipline intersects with others around campus. A more intensive collaboration with Information Sciences may help to promote some of these efforts, but it will likely require the Computer Science program to rethink its own curriculum and perspectives of what type of program they want to be since the resources are not available right now to be all things to all people. Might there be something unique or distinctive within the context of interdisciplinarity that the program can do that may be different than other computer science program around the UW System?

Conclusions

The Computer Science program is currently in a state of flux due to changes within the faculty. They have done a good job maintaining the program for their current students to ensure that they are progressing sufficiently. The self-study laid out several “possible futures” for the Computer Science program and these were summarized above. In my opinion, the program should consider reframing their program in a way that takes advantage of the interdisciplinary nature of the campus. It is already doing this to some extent with its participation in the HIMT program as well as ongoing discussions with Design Arts and faculty interested in the digital humanities.

Cc: Kaoime Malloy, Academic Affairs Council
Andrew Kersten, Associate Provost
Cliff Abbott, Chair, ICS

11/2
3/20/2012

Notes and Questions for the Computer Science Program Review

← this is
the old
curriculum
1/20/12

Accomplishment since last review:

- Create client programs in a Java platform for desktops while keeping the C programs on Linux. This allows student group projects that run across different languages, platforms, and language paradigms.
- Designed, created, and tested new demo programs illustrating threads, scheduling, synchronization, and I/O for a Linux environment.
- Replaced Visual Basic with C# languages and Microsoft Access with SQL Server.
- Incorporated OpenGL interfaces embedded in C++ programs for Computer Graphics.
- Introduced XML, ASP.NET, SQL Server access and ADO.NET for Internet Programming.
- Incorporated the next version of Visual Studio.NET, STL for Data Structure Theory course.
- Introduced IBM's Rational Rose, Microsoft's Visio, Microsoft's MS management, and IBM's Rational Software Architect for System Analysis and Management.

Strengths of the program:

- Instills high academic standards on students that there is good success for the graduates to find employment in their fields and occupy the highest levels of salary rank and their education is closely related to their jobs.
- Very committed faculty members to constantly adopting new computing technology for the program.

New challenges and continuing areas of need in the program:

- Substantial personnel changes that result in shortage of capable instructors
 - Death of Bruce Laplant. The replacement left for ITT in the fall of 2012.
 - Prof. William Shay retired in the spring of 2012. His position to relocate his position to Communication.
 - Prof. Hosung Song left at the end of the fall of 2012.
- The program faces difficulty of remaining its high quality program with reduced staffing at the same time that there is increased interest from outside the program in making its expertise available to wider audiences such as those in the humanities, design arts, etc.
- Internet Programming and other computing technologies faces rapid obsolescence cycle and tighter security; faculty and lecturers require constantly learning and adopting new computing technologies.

- Fluctuate in the overall enrollment and apparent gender imbalance in the program.
- Have a very high attribution rate of the program, as high as 80%.
- The program title "Computer Science" is a constrained factor; and there are significant core bases and skill sets expected for the undergraduates enrolled in this program.

Questions:

- Are there strategies as to reduce the attribution rate while maintaining high academic standard?
- What complications would we expect if the program title changes from a very constrained "Computer Science" to lesser constrained titles such as "Digital Studies"?
- Why replacing upper-level courses such as Scientific Computing for lower level curriculum would rescue the program from the staffing issues?
- Why expanding the tracks to include Data Analytics, Information Technology while the program is under severe staffing constraint?
- In reviewing Students' Rating for the Majors, the following categories were rated lower in Computer Science Program than those in UWGB: (1) Frequency of Courses offered in your majors, (2) Quality of teaching by faculty in your majors; (3) Knowledge and expertise of the faculty in your majors. Any explanations?