Three-Year Check-In for New Programs

The creation and maintenance of graduate programs and certificates represents significant resource commitments by faculty and staff. Given these investments, in 2014 the Graduate Faculty Executive Committee (GFEC) established a “check-in” process for newly approved programs and certificates prior to their first formal university review (which occurs in the fifth year.) Through this “check-in,” the GFEC hopes program faculty and staff will assess the implementation of their new program and determine what mechanisms may be needed for sustained student success.

Progress reports will be included on GFEC agendas, and program representatives may be asked to attend GFEC if additional information is requested. In the interest of brevity, please keep responses to 300 words or less.

Program Name

| Computer Sciences Professional Capstone Certificate Program |

Term of First Enrollments

| Summer 2014 |

Check-In Completed By

| Suman Banerjee |

Date Completed

| 10/27/2017 |

Academic Quality and Student Success

1. Provide an update on any changes to the program’s curriculum and learning outcomes. Include a description of the program’s typical course modalities (face-to-face, online, asynchronous discussion, team or individual assignments) and if courses have evolved based on faculty or student feedback.

   To be eligible for the Computer Sciences Capstone Certificate, students in the program will need to complete four computer sciences courses, with an average grade of at least a “C”. Two of the courses must be taken at the 400 level or higher. In order to take the four core courses, students must first complete prerequisite courses (CS 300 and CS 400) or have taken the equivalency elsewhere.

   The program can be completed part-time or full-time, allowing students the flexibility of taking only one class per semester. Students have the option to enroll in on-campus courses during the day or can choose from several evening courses that are offered off-campus at Epic.

   Computer Sciences courses are taught in an in-classroom, face-to-face format through lectures and lab sections. Student learning in computer sciences courses is generally assessed through exams or individual/team projects.

   Upon completion of the Computer Sciences Professional Capstone Certificate Program, all students should be able to achieve the following learning outcomes*:
1. Recognize and apply the core principles of Computing (abstractions and algorithms) to solve real-world problems.
2. Use fundamental and detailed knowledge, skills, and tools (e.g., specific algorithms, techniques methods, etc.) of computer science and develop the ability to acquire new knowledge, skills, and tools.
3. Design and implement software.
4. Can solve problems by applying a broad toolbox of knowledge and techniques.

2. Briefly explain the program’s learning outcomes assessment plan and discuss how you are or how you plan to evaluate student learning. Summarize any data collected to date showing evidence of student learning.

During the 2017-2018, 2018-2019, and 2019-2020 academic years, we plan to assess all Learning Outcomes through four different assessment activities, including one direct form of assessment.

In spring 2018, an Exit Survey will be sent to all students graduating with the MS degree in spring 2018 and from fall 2017. The survey contains questions asking students to rate their confidence level of Learning Outcomes #1, #2, and #3, gained from their Capstone Program. During this semester, we will also be examining courses evaluations for courses with a high number of Capstone students enrolled. These course evaluations will contain questions directly related to each of the four Learning Outcomes.

In spring 2019, we will conduct a direct assessment of Learning Outcome #3 (Design and implement software), by evaluating projects using rubric in upper-level project courses (e.g., 537, 540).

In spring 2020, we will assess Learning Outcome #1 (Recognize and apply the core principles of Computing (abstractions and algorithms) to solve real-world problems) and #4 (Can solve problems by applying a broad toolbox of knowledge and techniques) through an Alumni Survey that will be sent to all Capstone Certificate Program Alumni who have graduated within the last 3 years.

3. The GFEC is interested to learn how departments balance faculty and staff teaching loads and responsibilities between new and existing programs. Discuss how the department or program is achieving balance, and what challenges supporting multiple programs may have created for teaching, student services, advising or funding. Also of interest is information on what if any assets are shared between programs, or additional benefits that have been realized.

The CS department has taken a two-pronged approach to meet the additional teaching load. We have hired part-time instructors (lecturers and faculty associates) to increase our teaching capacity. These new instructors are taking some of the teaching responsibility of additional courses, or adding teaching capacity to existing courses to support the growth.

Clearly significantly challenges remain which limit the opportunities of growth of this program. In particular, there appears to be significant interest and demand on this program and to admit a larger pool of students into the program requires hiring on a number of additional faculty, faculty associates, and lecturers. Computer science instructors are usually hard to find because the industry in this space also experience shortage of trained individuals with great software skills, and such individuals tend to get drawn into industry software jobs for their higher pay and opportunities. More teaching and faculty positions need to be created to meet the increased demand in the program, and compensation needs to be commensurate with the median numbers in the industry.
Finally, the regular undergraduate certificate program and the professional version share some synergies as some of the students take the same courses. They potentially interact in the classes, and taught by the same instructors when possible, allowing the students in the two programs to also learn from each other’s experiences.

4. Please describe how your program has ongoing and broad faculty commitment, including governance, to ensure its continued success. If applicable, reflections from faculty and staff can be included here or as an appendix. Also consider if implementation of this program is supporting the Department and/or School/College’s current strategic goals.

The department has a professional programs committee that is responsible for proper management of the program. The committee reports to the department chair, and works closely with the department’s education and curriculum committee, the directors of graduate and undergraduate studies, the budget committee, and the department chair to identify various issues related to staffing, scheduling, and planning of courses. The faculty in CS as a whole has been supportive of this program, as they have been willing to admit students in this program into their classes when possible to enable them to make progress throughout the program. Still some challenges remain, as the department is strained in teaching capacity and scaling of this program is limited by such capacity.

Operations and Administration

5. Illustrate how the program has either brought in NEW and ADDITIONAL students (required for non-pooled programs), and/or how overall enrollment in your related programs has remained steady. If unanticipated overlap with existing programs has resulted, discuss steps to mitigate the overlap.

The Professional Capstone Certificate Program was designed for a distinct audience—working professionals with a BS degree in a quantitative field such as mathematics, physics, or statistics, who want to learn the fundamentals of Computer Sciences so that they can apply for a developer job in Computer Sciences. We have not experienced any unanticipated overlap with the PMP or the traditional graduate programs, as these students generally have different sets of program requirements and career paths after graduation.

The Capstone Certificate Program continues to experience growing interest from prospective students and has tripled enrollment since the first admission term. We expect enrollment in the PCP to increase or at least remain steady over the next few years, due to increased market demand for skilled professionals in the CS field.

6. Funding Considerations

   a. For traditional/pooled programs – How is the program successfully funding its students?

   The students in the capstone certificate programs are self-funded.
b. For non-pooled programs – Provide a brief summary of projected vs. actual revenues and expenses. Does the program have sufficient enrollment for sustainability? Discuss the current market outlook compared to the original marketing study, and plans to grow or change the program to become sustainable.

The program has been sustainable right from its first year of the program. We have a steady pool of students who join the program, especially from Epic, because of their strong interest in the program.

The program can certainly be grown significantly, but it needs additional teaching capacity and related plans before we can do so.

In the 2016-2017 academic year, the program brought in a total revenue of more than $1.5M with a little more than $800,000 in expenses (including the L&S fee).

7. If the program admits international students, describe how program processes address length of stay visa issues, online course restrictions, and needing ESL services.

International students enrolled in the Computer Sciences Professional Capstone Certificate program are expected to enroll full-time, as per student visa requirements. Thus, international students are generally able to complete the Capstone program within 3-4 semesters. International students receive an I-20 set for two years. The majority of international students graduate within two years and are only allowed an I-20 extension under extenuating circumstances.

All required coursework for the Professional Master’s Program is delivered in an in-classroom format. Online courses are not offered through the department and are not generally taken in other departments. International students are made aware of ISS policies regarding online courses taken during final semester of study.

The Computer Sciences Capstone Certificate Program Admissions Committee evaluates all parts of student applications, including English language proficiency test scores. Very few international students are admitted who do not meet Graduate School minimum requirements.

8. Are there any issues impacting the program’s long-term sustainability? If so, what support would you like to help you succeed?

The program has demonstrated its sustained operations over the last three years and is projected to continue as a successful program in the future. Growth in contingent on additional resources to staff instructional support at all levels — in CS, faculty, faculty associates, and lecturers, all teach lower level and upper level undergraduate courses and such courses are strained in capacity which limits further growth.

If the program continues to grow, we will also need to seriously consider increasing our support services, including hiring an additional professional programs coordinator and a programmer to help streamline our processes.