October 2011

Proposal for Establishment of Academic Benchmarks for CS Undergraduate Major
Submitted by the Undergraduate Office

Purpose

In an attempt to address both the issues surrounding students who fail multiple courses in the opening sequence of the computer science major, as well as addressing the problems of students who must delay taking their first computer science course by a semester (or more), the undergraduate office proposes that the Education Committee votes to establish clear benchmarks (at the behest of the College of Computer Mathematical and Natural Sciences as well as the College of Undergraduate Studies) for our computer science majors.

Background

In 2004, the University established the Student Academic Success-Degree Policy to "promote undergraduate student success" in order to "establish[] a structured framework [as well as] criteria to guide all students to completion of an undergraduate degree within a responsible period of time." (Attached with this proposal is a full copy of the policy as it was written and as it is currently implemented.)

While the Computer Science Department has complied with the original policy by creating four year plans that "specify the degree requirements for each major and provide graduation within four years," the CS department has not officially "establish[ed] graduation progress benchmarks" for our major.

Much to our credit, in an attempt to ensure retention and timely graduation, we have mandatory advising for all majors and meet with our students once a semester to check their relative progress as well as give them permission to take courses for the next semester. These meetings have ensured, for the most part, that students are progressing to graduation in a timely fashion.

For now, the Computer Science Department follows the former CMPS benchmark guidelines which read as follows:

"Starting in Fall 2005, all CMPS students are required to complete at least 4 courses specifically required of their majors and at least 3 CORE courses each year. Satisfactory progress toward these benchmarks will be assessed by your academic advisor."

This language is vague; thus, ineffective.

Even with more than adequate advising, unclear benchmarks, obviously, do not ensure that our students complete their degrees on time. We have a growing number of students (there are nearly 1100 undergraduates in the computer science major now), and it has become increasingly difficult to keep track of each student as closely and as individually as we once have. Along

with the growing number of talented students we have, we also have a significant number of students who are unable to pass the first four classes in the major (CMSC131, CMSC132, CMSC216, CMSC250) without having to take them multiple times. To ensure that students complete their degrees in a timely fashion (one would hope by four years), repeated attempts at one CS course—let alone multiple courses—is not feasible. Repeating classes delays graduation and in some instances takes up resources, such as TAs' and Instructors' office hours, that all students, not just the ones who are struggling, need. Along with the benchmarks for the major, we need to address the upcoming transition from CORE requirements to General Education Requirements as well so that students can incorporate the new requirements and graduate in a timely fashion.

It is imperative for the Computer Science Department, CMNS and the College of Undergraduate Studies to make sure that our students who enter the CMSC major without being qualified to take MATH 140 (Calculus I) have a sense of what they will be doing as computer science majors. Those who are qualified to take MATH140 also take CMSC131 and hopefully get a good sense of what they will be doing in the major; they are also able to at least begin to determine if this is the best major for them. However, a number of students accepted to the University of Maryland, who then decide to become Computer Science Majors, are not able to articulate anything at all about the field. Many (but not all) of these students are placed in MATH115 (Pre-Calculus) or other math courses.

Students not placing into MATH140 will have to wait at least one semester before taking a course in computer science. This wait presents a problem for them. If students do not have any prior knowledge about Computer Science and they do not take a course in the department, they do not get a chance to begin to understand what it is to be a computer science major. They also do not have many chances to meet and interact with other computer science majors, and may feel isolated from the department and the major as a result.

Setting a clear path to graduation with set points at which both students and advisors can monitor progress will allow for both parties to understand clearly that if progress is not being made in the major, then students, with the guidance of advisors, can begin to transition out of the computer science major into a major more suitable for them.

Benchmarks

Therefore, the Computer Science Department's Undergraduate Office proposes the following new benchmarks for computer science majors:

1.) Students may not repeat more than one CMSC course in the first four course sequence of the major. Benchmarks commence at the start of a student's matriculation into the computer science major.

2.) All CS undergraduates must take a computer science course in their first semester as a computer science major. If a student qualifies for CMSC131 or higher, he or she will take the appropriate course for their MATH and AP or Exemption exam placement. Those who are not eligible for CMSC131 (meaning that they are not qualified to take MATH 140) must take one of the following courses: CMSC122, CMSC198I, or CMSC289I. All computer science students are strongly urged to take CMSC100 along with their courses, but this course is not mandatory.

3). At 45 credits (of courses taken at the University of Maryland), students must have the following courses completed:

MATH 140 and MATH 141: With a grade of C or better
CMSC 131 and 132: With a grade of C or better
CMSC216 and 250: With a grade of C or better
Fundamental Studies English (ENGL 101)
At least 16 credits of CORE or General Education courses (Not including MATH or Analytical Reasoning).

3.) At 75 credits (of courses taken at the University of Maryland), all students must have the following courses completed with a grade of C or better:

MATH 2XX/AMSC4XX (not cross-listed with CMSC) or STAT 4XX
CMSC 330 and 351
All CORE or General Education courses

Implementation Plan

During winter and summer orientations, all incoming students will be informed about benchmarks as well the expectations that the Computer Science Department has for them as CS majors.

Any student who chooses to change his or her major to computer science will sign a document indicating that he or she understands the benchmarks as well as the requirements for the major. First year students who take CMSC100 will be reminded of the benchmarks during the course of the semester.

This information shall also be reinforced during mandatory advising meetings (held once a semester). Students will also be able to obtain information about benchmarks on the undergraduate website (http://undergrad.cs.umd.edu); a clear explanation of benchmarks will also be distributed to the undergraduate mailing list.

The undergraduate office will conduct audits of all student records at the close of each semester (in December and May). Once a student has met all established benchmarks, he or she will no longer be audited. All full time students transferring into the computer science major will be

evaluated at the conclusion of their first semester in the department. Part time students will complete an individual plan with a CS advisor.

The Computer Science Department's Undergraduate Office will notify in writing all students who have not completed benchmarks. This information will also be recorded in internal and university wide systems used for advising. The Undergraduate Chair and all computer science advisors understand the policies surrounding benchmarks as well as the progression through the major. All new members of the undergraduate office will be responsible for learning and understanding the benchmarks and the courses in the major.

Those students who do not complete benchmarks by 45 or 75 credits will be reviewed by the undergraduate office. The names and records of those students will then be passed along to the Director of Student Services for CMNS. After consulting the undergraduate office, and the Undergraduate Chair, the Director of Student Services for CMNS will then make the final determination of whether or not those students remain in the computer science major.