Undergraduate Report

Buster Dunsmore

September 12, 2016

Bridge 2013 update

- 19 students in our first Bridge Class (July 29 - August 9, 2013)

- Accepted 20 students, but lost one to the family farm

- Where are these 19 now in what would be their senior year?

- 1 IPFW
- 3 Science
- 4 Management, Aviation Technology, Polytechnic Institute, Health and Human Services
- 11 Computer Science!

- 11/19 = 58% on target for Spring 2017 graduation

Bridge 2013 update

- One of these students is a member of Undergraduate Student Board (USB)
- Several have earned academic honors during many semesters

- Company called few weeks ago
- Asking for recommendation for young woman who was in our first Bridge Class in 2013
- She came to us with no programming experience
- Did well in Bridge class, all her CS classes, will be graduating in May as one of our top students
- Sounds like she is going to get a very nice job offer from an excellent company

Summer 2016 Bridge Class

- 51 students
- Monday, August 1 - Friday, August 12
- Could have accommodated 72 students
- But, fewer incoming students this year with absolutely no programming experience

- TA staff: Maria Pacheco, Bridge Lab Coordinator, 11 UTAs (5 former Bridge students)

Summer 2016 Bridge Class

- We have found that students who are comfortable in first CS course and do well in it…
  - …usually do well in all their other CS courses
  - …usually get the Computer Science degree

- We started the Bridge Program to try to make sure that anyone who wants to can be in best position to do well in her/his first course

Summer 2016 Bridge Class

- This year's students...

- Finished several projects and several lab assignments during the two week program

- Took a live coding final exam last morning

- Schedule was very full, but students (and staff!) did a phenomenal job

Summer 2016 Bridge Class

- ## Students:
  - Have learned tremendous number of Computer Science concepts
  - Have experience with labs and know how we conduct them
  - Have met and gotten to know several members of their incoming freshman class
  - Have met and gotten to know CS students who will serve as lab instructors and mentors for them
  - Were on campus early, explored the campus and CS building, and knew their way around (unlike many freshmen who will be lost for the first week or so)
  - Were confident that they can succeed
  - Gotten a chance to learn about CS careers and met some of our Corporate Partners … who may give them an internship or a job some day!
  - Formed friendships that will carry throughout the academic year … and likely will last throughout rest of their life

Summer 2016 Bridge Class

- One student's observation:
    - "I took programming in high school
    - You have covered in 2 weeks of Bridge more than I learned in high school"

- They learned a lot
- They are not just ready to do ok in their first CS course
- Their are ready to excel in that course!

- 2016 Bridge Class Final Luncheon in Buchanan Club atop Ross-Ade stadium

Summer 2016 Bridge Class

- The best thing about Bridge continues to be
- Administrator of Undergraduate Programs and Services and new Bridge Class Coordinator, Scott Nelson
- His enthusiasm is like a virus that every student catches!

- Scott will get us back together at the end of the semester for a pizza party
- Students will get a chance to suggest changes for next year's bridge class
- We are going to find out about their first semester and how well they did

CS 18000 Fall 2016

- In the spirit of the Gold and Black Computer Science Courses at Harvey Mudd College...

- We have Gold and Black sections of CS 18000 in Fall 2016

- CS 18000-GOLD -- 194 students, assume absolutely no programming background, class section taught by Prof. Prabhakar, their own lab sections

- CS 18000-BLACK -- 225 students, assume some familiarity with programming, class section taught by Prof. Dunsmore, their own lab sections

CS 18000 Fall 2016

- The two sections will have identical final outcomes that are the same as CS 18000 outcomes in the past

- The only difference is the level of prior programming knowledge with which the students start the course

- Topics with which we assume students are familiar in the CS 18000-BLACK section
  - Types and Strings
  - Classes, Objects, Methods
  - Selection (if, switch)
  - Repetition (while, do while, for)
  - Arrays

CS 18000 Fall 2016

- Students self-selected after meeting with their advisor during STAR (Summer Transition Advising and Registration)

- Our primary motivation behind this effort is to increase retention

- We want to ensure that students with the ability to do well in Computer Science do so even if they have not programmed before

- We want to keep the inexperienced students in CS 18000 from being intimidated by students with a lot more experience than they have

CS 18000 Fall 2016

- Vitally important that the messaging on these two sections is given clearly to all students and staff

- If the message somehow is that there is a "remedial" or "weaker" section, then we will have failed

- Each lecture section will cover the same material each week

- The CS 18000-GOLD section will be our standard CS 18000 lecture

- The CS 18000-BLACK section will be a review for most students at the beginning of the semester

CS 18000 Fall 2016

- About half way through the semester, there will likely be little difference in the lectures

- All labs, projects, and exams will be identical for both sections

- Separate Piazza pages

- After 3 weeks, so far, so good

- A few students have asked to transfer from CS 18000-BLACK to CS 18000-GOLD

Research Survey

- Research project concerning...
- What kind of courses our students want to take
- What kind of graduates our Corporate Partners are looking for when they hire new employees

- CS student Zhen (Carl) Chen worked with me on a CS 49700 (CS Honors) project this past (Spring 2016) semester
- He created a survey for our students and got 186 responses
- He created a survey for our Corporate Partners and got 24 responses
- (Both of these response rates are pretty phenomenal)

Research Survey

- His major findings were that

- (1) Students want to learn new technology that they think industry wants

- Student Survey
  - 93.8% think we should offer new classes
  - Top suggestions were…
  - Web-based development
  - Mobile apps
  - (JavaScript, SQL, Ruby, AngularJS, Node.JS, MongoDB, Electron, Bootstrap)

Research Survey

- (2) Corporate Partner Survey

- Questions about…
  - What kind of technical skills you are looking for
  - Level of importance you assign to:
  - internship experience
  - in-class projects (projects students do as part of their university classes)
  - personal projects (not part of their university classes)
  - whether a candidate has a personal portfolio of the work he/she has done
  - whether a candidate has participated in hackathons
  - GPA

Research Survey

- (2) Corporate Partner Survey

- Corporate partners find internships, GPA, in-class projects, and personal projects valuable in assessing students

- Other items (such as hackathons, personal website, apps published) not as valuable

Ben Delaware, Programming Languages Track Chairman

- We have lost Patrick Eugster
- Ben Delaware
- New faculty member
- Ben is forming the Purdue PL Research Group (PurPL) with faculty members in CS and ECE
- Weekly seminar series for anyone interested PL theory, design, and implementation, language-based security, compiler optimizations, verification, program synthesis
- In 2015 Scott Nelson estimated 256 Software Engineering Track students and only 7 in Programming Languages
- Ben has agreed to be the new Programming Languages Track Chairman