**Response to Advisory Board Questions**

**September 8, 2011**

**Q1: What is the driver of the decreased student enrollments?**

Nationwide, enrollments have dropped significantly from 2001-2007which ties well to a reaction from the dot-com bubble in the late 1990’s. The Computing Research Association (CRA) has recently published a statistic that the number of students majoring in CS has increased 8.5% last year and 5.5% the year before. The creation of the ITM (Information Technology Management) program focused on training Information Technology personnel, now a cornerstone of the School of Applied Technology, likely had some influence on IIT’s enrollment in Computer Science. The fields are different, but there is enough overlap that there is almost certainly an impact.

The student faculty ratio (590/25) is high compared with peer CS departments in other institution or peer departments within IIT. The department covers 4,829 credits hours and 1,729 students in total in fall 2011.

Undergraduate enrollments increased for the 2011-12 academic year which is obviously a good sign. The school doesn’t gather detailed marketing data (such as the number of graduating students at top tier high schools in Chicago who wish to major in Computer Science).

**Q2: What is the percentage of international students?**

About 60% of our students are international students which is somewhat higher than the typical ratio for IIT as a whole (about 40%). Most of our undergraduate students come from the U.S., and over half of our graduate students are international students, which are similar with the ratios of IIT. Recently we have seen a shift in the composition of the international student population with more Chinese students attending and fewer Indian students, though both have large populations at IIT and in CS.

Last spring we had 590 total active students (graduate and undergraduate). 231 of these were domestic.

**Q3: What is the ratio of graduate to undergraduate students?**

In the Fall of 2010, 35% of Computer Science students were undergraduate and 65% were graduate students.

**Q4: What would be the ideal number of enrollment for CS?**

We currently have 600 students. Based on current faculty/students ratio, the ideal situation would be to improve the quality of education and research while maintaining the current population. Obviously with an increase in the size of the faculty and facilities, we could accommodate a larger student population. We believe that this would be desirable, especially in the context of the plan to continue to increase the over-all undergraduate population at IIT from roughly 2,700 to 3,500.

**Q5: How does this compare to other schools in the area?**

UIC has less than half the graduates, but close to double the number of faculty members. DePaul has more than triple the graduates, but has more than four times the number of faculty members. The CS Department at IIT has done a reasonable (in our opinion) job in maintaining a large student body with a relatively small faculty size, compared to both local and national competitors. Obviously it would be our desire to add faculty in a couple of key areas.

**Q6: What makes it compelling for students to come to IIT for CS?**

A solid core education with a curriculum that has been vetted with top ranked Computer Science programs and that has proven to be extremely relevant to both top tier graduate schools and a wide array of employers. Our graduate program is particularly attractive to international students affording them an opportunity to obtain a high quality degree with specializations that meet their particular interests and needs. The significant research efforts that are being pursued in the department add to the attractiveness of the program.

**Q7: What are the niche skill sets that students are going to get?**

At the undergraduate level we do not offer niche skill sets. We believe we are teaching robust foundational skills that are crucial for today’s “big data” environment. That being said, we are one of the only curriculums that includes information retrieval, data mining and information security and wireless networking at the undergraduate level. We are also, to our knowledge, one of the only departments that aggressively leverage open source technology in these classes. At the graduate level we offer a strong complement of specialization areas at the Master’s Degree level including: Business, Computer Networking and Telecommunications, Information Systems, Software Engineering, Distributed and Cloud Computing, Education

**Q8: Do we know if corporations are recruiting more computer engineers vs. CS graduates?**

A service called *wantedanalytics.com* scans job listings across the country. One recent quote (September 7, 2011) states “in the past 30 days, more than 48,000 new jobs were advertised online for Engineers, making it one of the most demanded occupations in America. At an overall 10% year-over-year increase, this field is one of the more difficult positions for corporate recruiters and staffing firms to fill.” That being said, the site lists Computer and IT Related Occupations as consistently the second highest number of job listings (second only to Healthcare). It is clear that both occupations are heavily recruited. Based on the statistics collected by IIT, CS has the highest employment rate of 73.91%; Computer Engineering has a rate of 66.67%. Armour College in average is 65.93, CSL 65.67%. Our experience at IIT mirrors these statistics with Computer Science and ECE graduates both being in very high demand.

**Q9: What is the perception of prospective students on the quality of the CS department?**

The university, at present, does not run focus groups or surveys on the perception of potential students. Therefore, unfortunately, any answer here would be purely anecdotal.

**Q10: Do we have stats on percentage of students who get jobs for CS and Engineering?**

In 2010, 56% had a job in less then 3 months after graduation. In 2011, 72% had a job within 3 months based on a survey with an 80% response rate. (August survey on May graduates in both instances). Overall, almost all of our students are offered a job or go to graduate school by the Fall following their graduation.

**Q11: Where do students go after they graduate?**

We have a list of companies that have hired students in the past three years. The list includes everything from startups to large companies like Google and IBM.

**Q12: What does it take to be on preferred list for large technology oriented companies?**

We followed up with a conference call with Kim Hammonds who offered to provide this information for Boeing. Boeing has a board that determines the list and though there are various criteria, generally, if employees from a school do well, the school is often placed on the preferred list.

**Q13: What companies have us on the preferred list for hiring?**

Motorola, Cleversafe, and Orbitz have confirmed we are on the preferred list. Historically, Motorola, Bell Labs have been major employer of our students as well though the fortunes of these companies have dramatically reduced their hiring in recent years.

**Q14: What would it take for us to be on the preferred list?**

We have started an effort to reach out to each organization that is represented on our advisory board and personally contacted each group that makes the preferred list. Starting (or in some cases re-establishing) these relationships is an obvious first step. However, it will clearly take time.

**Q15: What is the focus of new graduates: startups, big companies, grad school?**

Of 52 companies that hired our students in 2011, only eight are very large, established companies.

**Q16: What methods are we using to reach into grade schools, high schools – what are we doing to generate excitement in secondary schools.**

Commentary: Middle school girl’s summer camp (sponsored by our Board Member, Andrea Berry) is an excellent example of how to introduce them to “stem” subjects. Professors Hood and Winans ran this summer camp for middle school girls this past summer. The Aunt of one of our campers summed up the experience very well:

It is such a pleasure to be in touch with you.  My niece Kamaya absolutely

loved her experience in the Computer Discovery Camp this summer.  I fact,

she is still in touch with several of the students from the camp via the

internet.

When I first spoke to my sister about sending Kamaya to the camp, Kamaya was less than pleased because she didn't want to go to "Nerd Camp".  Her tune changed after the first day.  She came home excited about the projects,about the teachers, about the other students and about the "real" food. Kamaya was eager to go to camp each day and would wake my sister up early so she wouldn't be late.  Her days at camp were the topic of conversation when I spoke to her in the evenings and she proudly announced to me that now she's a "nerd" like her Aunt.

Kamaya told us that the camp might meet during the school year and she has

been bugging my sister to call about the start date.  This experience has

really changed my niece's perspective on school and learning in a positive

way.  I am so happy that you have taken on this project and that the

University is supporting projects of this nature.  You have made a

significant impression on my niece and I am grateful.

This “camp” is continuing as a weekend program through the Fall semester through the volunteer efforts of Prof. Winans

Professor. Bauer attended CST (Computer Science Teacher Association) meetings and met a number of local high school CS teachers. Additionally, Prof. Bauer visited eight local high schools and gave talks on computation and IIT.

Professor Beckman taught CS331 (Data Structures and Algorithms) online for high school students (spring 2010 20 students, spring 2011 40 students. Three are attending IIT now.

Professor Bauer was awarded an NSF/Collegeboard grant to teach the new AP CS class "CS Principles" at IIT in Spring 2012 (possible outreach to local high school students).

Professor Raicu offered research funding to new admitted CS first years (in addition to IIT funding), which helped to entice them to come to IIT.

Overall, IIT is engaged in a wide variety of Computer Science oriented STEM events including our FIRST Robotics activity that Boeing, Motorola, Baxter, GM, Penny’s and many others are also heavily involved in pursuing, and our Brookfield Zoo effort lead by Professor Hood and reviewed in the meeting has a significant outreach component.

**Q17: Need better breakdown of students as to where they are from?**

For the past three years when looking at incoming undergraduate students, we find only 17 out of 73 incoming Freshmen (or only 23%) came from Chicago. We think this represents a huge opportunity where relatively focused outreach could yield significant, meaningful increases in new students.

**Action: Determine our preferred target marketing areas for students. Do we want more international students? Can we do some analysis to suggest which students are most successful here – longest retention – high grades – good jobs after they graduate?**

We have thought about this one and the truth is we do not really care where students are from. We care that they are good students, energetic, eager to learn and who have some reasonable aptitude for Computer Science. Note that our curriculum does not require any advanced or even basic Computer Science knowledge. We merely need a student with aptitude and desire and we can teach them what they need to know.