Milwaukee School of Engineering
B.S. Computer Engineering
Industry Advisory Committee meeting
Friday, October 12, 2018

Attendees

Industry Members

Mr. Ryan Barnett, Collins Aviation
Mr. Lon Bushweiler, Plexus
Mr. Kelly Hanaway, Baldwin Vision Systems
Ms. Elyse Hobson, Johnson Controls
Mr. Joe Izzo, Rockwell Automation
Mr. Dave Neuman, Brady Corporation
Ms. Cyndi Przybylski, Rockwell Automation
Mr. Jeff Zingsheim, IAC Chair, SysLogic

Student Representatives

Mr. Jaden DeFields, '21
Mr. Jack Haek, '22

CE Faculty

Ms. Deborah Varnell
Dr. Adam Livingston
Dr. Darrin Rothe, Interim Program Director

Recorded by Darrin Rothe

Welcome and Introductions

IAC Chair Jeff Zingsheim called the meeting to order at 8:29 am. All members present were asked to introduce themselves. Items of note:

- Joe Izzo will be retiring soon from Rockwell Automation
- Kelly Hanaway is now with Baldwin Vision Systems

Previous Minutes

Previous minutes (from meeting on 5/25/2018) were reviewed and no changes proposed.

CE Program Updates

Dr. Rothe presented the following CE program updates:

Czech Exchange Program

Four students approved to participate in program in spring of 2019. Also, two CE students planning to participate in new exchange program with Victoria University of Wellington in New Zealand, also in spring of 2019.

CE Student Statistics

Strong fall enrollment of 55 traditional freshman plus four transfer students joining the program. Related programs had enrollments of 50 for CS and 48 for SE. SE's numbers were down slightly from the previous year, but still ahead of predictions.

Retention in the CE program remains a concern and is being watched by CE faculty.

Discussion

At this point a general discussion on student retention was opened.

Dr. Livingston noted that CE may experience enhanced enrollment due to publicity surrounding the new CS program and building.

Jack Haek agreed, stating he had great interest in the new building. He is planning to pursue dual CE/CS degree.

Dave Neuman asked how can we distinguish CE vs. CS graduates? Jack Haek suggested emphasizing the hardware aspects of CE, and Jaden DeField also agreed that topical areas such as artificial intelligence seem to align more with CS.

Cyndi Przybylski stated that most CE graduates she has interacted with are generally wanting to work with hardware.

Jeff Zingsheim emphasized that [an employer's] recruiting message must be clear as to what majors they are targeting.

Cyndi Przybylski also noted that they can usually filter candidates via their resumes.

At this point, a graphic depicting cohort tracking of the Fall 2011 class was presented. CE appears to have the greatest percentage of withdrawals and major changers between year 1 and year 2.

Elyse Hobson asked what the minority statistic were for the program. This request was echoed by Dr. Livingston. Dr. Rothe noted that he was not aware of any such statistics, but minority enrollment was rather low based on personal observations.

Dave Neuman asked if retention focus is for CE-only or entire university. Dr. Rothe responded that our discussion today is focused on CE primarily as we have some control over the program.

Dave Neuman asked about a more generalist approach to the first year. Dr. Rothe noted that MSOE has direct enrollment into specific programs and a generalist approach within a single program may not align with the direct enrollment model. Dave Neuman then asked for student representative comments.

Jack Haek noted that accepted student days helped him understand exactly what the CE program entailed and that it was for him. Jaden DeFields noted that taking on two programming languages in the freshman year could be seen as challenging.

Cyndi Przybylski suggested that PLTW helps, educating prospective engineering students prior to college the differences in difference degree programs. Dave Neuman agreed that upstream education was helpful. Elyse Hobson agreed as well, and also noted that she had a very odd path to CE – earlier awareness may have been helpful.

Dr. Livingston indicated concern that some freshman students leave the program before getting to the "meat" of the curriculum in years two and three.

Jeff Zingsheim noted that he has been through a number of curriculum revisions which have ranged from "too little programming" to now "too much?"

Cyndi Przybylski mentioned that she originally enrolled as an ME student and left because there was too much programming in the first year.

Jeff Zingsheim stated that maybe the first year needs to be more CE-centric.

Dr. Rothe noted that a more CE-centric first year could cause issues with students that do want to change majors – both away from and into the CE major. Lon Bushweiler said graduating in four years was important to him. Cyndi Przybylski noted that going past four years [with a change of majors] was quite stressful at the time, but less so looking back.

At this point, further discussion tabled, with the possibility of re-opening later in the meeting.

Recent and Upcoming Events

Dr. Rothe walked through the recent and upcoming events as noted on the agenda. Some items garnered a bit of discussion as noted:

- IEEEXtreme could benefit from industry proctors. Should be IEEE member, contact Dr. Livingston.
- CS Speaker series – is there an alumni email list for such announcements? Dr. Rothe noted that he was not aware of a formal list, but there is a list used to inform CE alumni of some events.
- Career fair:
    - Ryan Barnett mentioned that Collins Aviation made 12 on-the-spot offers at the fall MSOE career fair (editor's note – missed if those were full-time, intern, or a mix).
    - Jaden DeFields noted that navigation of the career fair was a bit difficult in that employers were listed with CE and SE fields grouped together, and upon inquiry, the employer was only looking for SE. Cyndi Przybylski said that it would be helpful if the university could provide more detailed summaries of each major to prospective employers so the employers could target each major more effectively. Dave Neuman suggested employers display skills tags at their booths so students can know which companies to approach.

Break

A short break was called.

Curriculum Review

Dr. Rothe provided an overview of the CE curriculum with special note that we are in the fourth year of this version of the curriculum and thus the first year that the updated senior-year networking courses are running. While CE4951 and CE4961 are updates to existing courses, CS4920 Information Security is now a required course and has also been updated a bit from its previous form as an elective. CS4920 remains an elective for SE, EE, and BE students.

Dave Neuman asked if SE has any required security courses. Dr. Rothe noted that is does not, but there are a number of security-related electives for SE students and are also open to CE students. Elyse Hobson extended a suggestion that they may wish to make security required in their curriculum. The suggestion was seconded by several.

Cyndi Przybylski noted that the topic would even benefit prospective interns and coop students. Dr. Rothe mentioned that CS4920 is very late in the CE curriculum, but perhaps it would be wise to sprinkle security topics into other courses in the curriculum.

Electives

Elective running this AY were listed by Dr. Rothe. The following were noted:

- Elyse Hobson is now with JCI's Data Science group. May be able to supply guest speaker(s) for the CS4981 Data Science elective.
- Dr. Livingston mentioned what CS493 Advanced Digital Design would cover. Dave Neuman asked what year student would be able to take, Dr. Livingston replied seniors. It was noted that the topic could be useful earlier in the curriculum.

General Discussion

In the few remaining minutes of the meeting, the discussion was steered back around to the earlier discussion of student retention, specifically in year one.

Dr. Livingston opened the discussion by stating perhaps we need an earlier introduction to C programming, which most agree is the foundation of embedded systems programming.

Jeff Zingsheim noted that this was discussed extensively at the last meeting and that it makes sense.

Elyse Hobson agreed that Java was a struggle.

Kelly Hanaway asked how many incoming freshman have programming experience. Dr. Rothe did not have exact numbers, but suspected that it was a relatively low percentage. Jack Haek agreed stating that he had experience, but thinks only two or three others in his first Java course at MSOE have previous experience.

Jaden DeField noted that he like the Java sequence and felt it was worthwhile.

Ryan Barnett echoed that he had the freshman Java sequence and has never used Java subsequently, but, felt it provided a good foundation for future work.

Elyse Hobson asked about topics such as deployment and dev ops with respect to embedded systems. Dave Neuman added the notion of providing field updates to embedded systems. Joe Izzo noted that Rockwell Automation is doing this extensively in-house, but not necessarily direct to customers.

Cyndi Przybylski noted that a course such as CE4100 seems to be a good tool to round-out the curriculum.

Dave Neuman closed the discussion by emphasizing the role of technical leadership.

Adjournment

The meeting was adjourned at 11:00 am. Most committee members stayed for tours of the Rockwell Automation facility.