MILWAUKEE SCHOOL OF ENGINEERING
B.S. COMPUTER ENGINEERING
INDUSTRY ADVISORY COMMITTEE
Friday, May 27, 2015

Attendees

Industry Members

Mr. Lon Bushweiler – Plexus
Mr. Ross Hanneman – Rockwell Collins
Mr. Joe Izzo – Rockwell Automation
Mr. Mark Keup – Cognex
Mr. Thomas Kraus – GE Healthcare
Mr. Mark Krueger – NVIDIA
Mr. Mark Siegesmund (guest) – CCS
Mr. Jon Ubert – QuadTech
Mr. Jeff Zingsheim, IAC Chair – Honeywell Corporation

Student Representatives

Ms. Jessica Flock '19
Ms. Josie LoCurto '18
Mr. Hunter Parks '18
Mr. Ryan Kraemer '17
Mr. Paul Scarbrough '19
Mr. Brian Scharles '17

CE Faculty

Dr. Eric Durant
Dr. Adam Livingston
Dr. Russ Meier
Dr. Darrin Rothe

Recorded by: Dr. Durant

Meeting called to order at 8:24 a.m.

Welcome and Introductions

Mr. Zingsheim, Chair, called the meeting to order. Mr. Zingsheim and Dr. Durant welcomed the group and introductions were made.

Note: All items on the agenda were discussed, but several informational items are not repeated in these minutes.

Approval of Minutes

The October 29, 2015 meeting minutes were approved.

Student Statistics

Dr. Meier gave a report on the new freshman curriculum being implemented this year. It shares the first two digital logic classes with EE. Most CE-prefix classes in CE quarters are taught by the fulltime CE faculty plus adjunct faculty member Mr. Mark Krueger. With EE sharing courses, now we also offer CE1911 Digital Logic II in spring, which serves as a trailer for CEs. None of Dr. Meier's advisees failed to complete CE1911 by end of the year. The new 4×4 curriculum has increased these to 4-credit classes, adding an hour of lecture. Freshmen did well with architecture. The DE0-Nano board worked well with the LT24 display board.

Fall meeting

Mr. Jeff Zingsheim will work on hosting this fall's meeting at Honeywell's plant in Pleasant Prairie.

Senior Projects

Dr. Rothe stopped soliciting projects from IAC a few years ago. Although these projects offered great benefits, students weren't selecting them, instead preferring their own project ideas.

Student Tours, IEEE, TBP

Dr. Meier is the advisor to MSOE's student chapter of IEEE. CE students Sam Voss and Kyle Kaja are the student leaders and the group had a tour of Astronautics this year. But, fewer companies have on-site production today so this makes for fewer tour opportunities; that is, some companies would only have cube farms to show.

Dr. Livingston is the advisor to TBP at MSOE. They are also interested in industry speakers and enhancing connections with industry. They serve many majors with significant numbers of CE, EE, ME, and AE students.

The advisors would be glad to make connections between the student groups and interested industry members.

Cybersecurity

MSOE is investigating offering a master's degree in this area and has asked for IAC input. The members stressed the importance of hardware and embedded security. Mr. Zingsheim said that his colleague, Paul, at Honeywell is doing a lot of hiring in this area and could be a potential resource during MSOE's investigation. An MSOE master's degree might provide an alternative to the many companies paying for outside training. Companies and their employees/students could choose to take a few courses or pursue

the entire degree. For faculty for such a program, look at PhD programs, especially for folks doing relevant research in CS and CE; Iowa State has center on this. Also look at the Information Assurance programs from CS and Business Schools. Important considerations include the combination of practical security and theoretical security and security in the context of the user experience.

Architecture II Elective

Following a 2-year cycle, we will be offering this as an updated elective in 2 years, when the freshmen who took the new architecture course will be juniors and might be able to fit an elective into their schedule. Dr. Meier may include more system level design, moving down the memory pyramid and out to the motherboard. Mr. Scharles noted that the current version of Architecture II was a great class since it integrated computer history topics.

CE2801 Embedded Systems I

Dr. Rothe reported that we're considering different hardware for this class. We have used and plan to continue to use LEDs, keypads, character-addressable LCDs, timer subsystems, interval timers, PWM using both polling and interrupts, etc. We might also use a UART with interrupts. The hardware will be the STM32-Nucleo with add-on parts.

CE2812 Embedded Systems II

Dr. Rothe reported that the same hardware will be used in this class as in CE2801. We will move to C and use the CMSIS (Cortex Microcontroller Software Interface Standard) API for accessing peripherals.

CE2820 Embedded Systems III

Dr. Rothe reported that in this class we will likely move back to using the DE0-Nano SOC. Embedded III will remain a project class. This class will not necessarily contain a lot of new material, but will focus on overarching project with familiar design aspects similar to the former car-in-a-box or camera-in-a-box. We will cover some SOC topics and apply them using hardware the students already own from their digital logic classes, making use of the ARM core processor with FPGA. Students have the LT-24 LCD. We will give them a camera module. They will develop an FPGA interface to the camera to read data through the hardware processor and display the image on the LCD. The SOC board has a lot of documentation; NIOS II was a good educational platform; one could develop peripherals, but it was difficult for the students to do. With the DE0-Nano SOC or STM32+Nucleo it is more straightforward for students; hardware resources are fixed and known.

Mr. Scharles likes the idea of using a different board for Embedded I/II than Embedded III. Dr. Meier noted that an advantage of the ownership model is that it connects students better to their work. The faculty selected, based on early discussions, a board that would not only support freshman classes but potentially all 4 years of the curriculum.

Mr. Kraemer noted that in Embedded III with Prof. Barnekow the students did board design with Eagle at the end of the course. Dr. Rothe noted that we have not yet determined if we will fit this elsewhere in the curriculum besides in the CE4100 elective. With the SOC topics in Embedded III, it may not fit there. But, we'll be developing CE3101 and it might fit well there. The faculty agree this board design is important to have in the curriculum if it can be made to fit.

Mr. Siegesmund, Mr. Bushweiler, and Mr. Izzo all noted that their groups make use of the CAN interface. Dr. Meier suggested that we try to integrate it into curriculum. Dr. Rothe's board has this on-chip, but he is not sure about the availability of the electrical interface.

Adjournment

Meeting adjourned to the senior design show at approximately 11:00 a.m.