2014 CptE Executive Council Assessment Report

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Chair, CptE Curriculum Committee

1. Background

The EECS Executive Council (EC) consists of the EECS Director and 10-25 representatives from industry. The EC is intended to give voice to the employers of graduates of the School of EECS. As such, council members are selected so as to be representative of the leadership of the largest employers of EECS graduates. One of the primary responsibilities of the EC is to provide industry perspective and feedback on the continuous evaluation of objectives and assessment of outcomes for the undergraduate curricula, and to suggest changes for implementation as needed. The EC meets with the School of EECS twice annually: once in the fall at a location convenient to EC members (e.g., the Silicon Valley), and once in the spring in conjunction with the Senior Design Poster Session at the WSU Pullman Campus. During the spring meeting each year, the chair of the Assessment Committee presents the previous year's assessment results to the EC. Detailed notes on the discussion generated by each presentation are delivered to the Assessment Committee following the meeting.

2. Assessment Methodology

The Asistant Director (Dr. Arslan-Ay) sent the Executive Council Meeting Notes to the Assessment Committee Chair in May of 2014. Appendix A contains the notes. The Assessment Committee Chair shared the Notes with the Assessment Committee to discuss and make recommendations.

3. Results

One feedback from the Council was to focus on teaching students the soft skills; e.g., how to work as a team and resolve issues within the team, building a collaborative environment where they don't avoid the conflict but deal with it in order to effectively work in that environment. Senior design course sequence (EE 415/416) currently addresses this.

4. Discussions and Recommendations

Integrate explicit training on soft skills into the new CptS/EE 302 "Professional Skills" course.

Appendix A: 2014 EECS Executive Council Meeting Minutes

April 24, 2014 EECS Executive Council Meeting Minutes

By: Sakire Arslan Ay

In attendance: Behrooz Shirazi (Director, School of EECS); Sakire Arslan Ay (Assistant Director, School of EECS); Pete Isakson (WSU Foundation); Devon Anderson (WSU Foundation); Don Shearer (WSU Foundation)

Dave Richards (Isilon); Jon Campbell (Microsoft); Mike Gutmann (FringeBits); Steve Muchlinski (Muchlinski Consultants Inc.); Mark Greaves (to represent Debbie Garcia - PNNL); Steve Knox (Ivycorp); Paul Wiegand (Puget Sound Energy); Mike Schroeder [via conference call from California] (Microsoft Research in Mtn View, CA); David Whitehead (SEL); Rob Schauble (HP); Floyd Rogers (Microsoft – retired); Rick Hoover (All Terrain Software)

1. **Update on the 7th Year ABET Visit:** For EE/CptE programs, there were no weaknesses. For CptS program, the ABET committee argued that the assessment data is insufficient. Executive Committee members were asked to provide feedback/suggestions to ABET coordinator Chris Hundhasen about the assessment process.

2. **Faculty Updates:**
   a. New faculty hires: Hassan Ghasemzadeh (Tenure-track Assistant Professor).His work is on information processing, data analytics, and algorithm design for networked embedded systems. Adam Carter (Clinical Assistant Professor) PhD student working with Chris Hundhasen. He is teaching introductory level programming courses: CptS 122 and CptS223.
   b. Faculty Promotions: Partha Pande was promoted to Full Professor. Andy O'Fallon was promoted to Clinical Associate Professor. John Scheneider was promoted to CEA Undergraduate Dean position.

3. Steve Knox asked whether the growth in faculty is due to increasing student enrollment or due to replacing the retiring faculty. Behrooz said that he would explain this during his presentation.

4. Steve Knox asked what did Partha do to make him stand up and get full professorship in a short time of 2 years. Behrooz explained that Partha is continuously publishing in top journals, and his work has very high citation rate (he has an impressive h-index score of 23 on Google Citations). Behrooz also mentioned that he has very high research expenditure. Sakire Arslan Ay added he graduated many PhD students, and all of them had ended up in very prominent positions. Most of his PhD students had academic positions in prestigious universities. One of his PhD students, Jacob Murray, is hired for the clinical position at Everett EE program.

5. **Faculty Hiring Plan:**
   Facult Searches for Everett EE Program: 2 tenure-track and 2 non-tenure track
   EECS already hired 2 non-tenure track faculty:
   1. Fancis Wang - Francis is very active in recruiting for the new EE Everett Program.
   2. Jacob Murray - Jacob has very good interaction with the students.

Computer Science Hires: 12 new tenure-track faculty positions in Computer Science. 3 in machine learning, 6 in data science (big-data), 1 in software engineering, 1 in cyber security (will work with the power group), 1 in sustainable design
Electrical/Computer Engineering Hires: 4 new tenure-track faculty positions in Electrical Engineering. 2 in power systems, 2 in microelectronics
2 non-tenure track positions in EE.

6. Behrooz explained that there is a push from northwest companies to the state to invest in BigData. State is investing 6.5M for Computer Science research. Part of this money will be used to cover budget cuts. Majority of the funds will be spent for new faculty hires. Behrooz said (answering Steve Knox's earlier question), the new faculty hires are both due to the enrolment rise in Computer Science program and university's investment in BigData research.

7. Dave Richards asked whether the faculty hired for the cybersecurity position will work on security issues such as security of credit cards, encryption etc. Behrooz explained that this faculty will work closely with the power group and help the security issues in the power grid.

8. Dave Richards asked if there are any plans to hire internal candidates and whether EECS is planning to hire Aaron Crandall for any of the open positions. Behrooz explained that the norm in academia is to let PhD graduates go work for other institutions for several years and prove themselves first. If they want to come back and if they are qualified for the position them may be hired. He said it is not common to hire own graduate in prestigious academic institutions.

9. Mike Schroeder [on the phone] asked, "Can EECS manage to hire qualified faculty for that many faculty positions?" Behrooz explained that there were very strong candidates that already interviewed for these positions. He said there is no rush to hire for all positions. The positions will stay open and we will continue the interviews until we recruit qualified candidates.

10. Floyd Rogers asked: "What citizenship do most candidates have? Are they mostly US Citizens?" Behrooz answered: Most of the candidates are non-US citizens. However we don't think this would be an issue in getting funding and grants. Recently most funding agencies have been accepting proposals from non-US citizen PIs.

11. Mark Greaves: US citizens are the only people that can be cleared for DOE proposals.

12. Mike Schroeder [on the phone]: If you only focus on US Citizens it will limit your choices. Most of the top candidates from top schools are non-US citizens.

13. **Recent faculty hires and pending offers**:
Hires in microelectronics: Dae Kim (digital microelectronics) and Subhanshu Gupta (Analog Microelectronics)
Hires in machine Learning: Jana Doppa and 2 pending offers.

14. Steve Muchlinski asked, "Are there any plans to expand in the Computer Engineering?" Behrooz: There is a possibility to grow. One of the new hires, Dae Kim will help with digital

microelectronics. If the research in that area grows, the dean is open to have new positions in computer engineering.

15. Joint (interdisciplinary) appointments: Behrooz opened a discussion on joint appointments where faculty will be appointed half by EECS and half by another department. The faculty will collaborate with faculty from both departments and conduct interdisciplinary research. The tenure progress will be evaluated by both departments. Executive Council members are asked to provide feedback on hiring faculty on joint appointments. Mark Greaves from PNNL has commented that PNNL is open to joint appointments.

16. Signature Areas in EECS: 1. Power Systems (10-11 Faculty) 2. Microelectronics (6-7 faculty) 3. Machine Learning/ Smart Environments (7-8 faculty) 4. Data Science (7-8 faculty)

17. Jon Campbell: "How do you think undergraduate computer science program will be advanced by the expansion in machine learning?" EECS is following the roadmap explained in the IBM tutorial on the recommendations for undergraduate teaching. [Action Item] EECS will send a copy of this document to all Executive Council members. (to do)

    Jon Campbell: There should be a steady state in the course offerings; new advanced courses should be offered in the focus areas at the undergraduate level.

18. Dave Richards. The college graduates interviewing for job positions are lacking the ability to write good quality software. This is one of the biggest frustrations that the we have when we interview with WSU gradutes. One of your focus areas should be teaching your studenst how to write good quality software. The cansidates are lacking the ability and skills to write good quality software, do proper testing managing software development. You should emphasize on teaching students how to write good quality software.

19. Jon Campbell: In some computer science courses, you should require the students to write unit tests along with their assignments. The course instructor and teaching assistant can evaluate the assignments using those unit tests. This would teach the students how to test/debug their own software and help them to write better software. It would also ease up the grading process. [Action Item] (The discussion on this will follow up online between Jon Campbell and Sakire Arslan Ay. Sakire Arslan Ay will connect Jon Campbell with EECS faculty and instructors that teach programming courses where the above approach can be applied.
    This also will be discussed in the EECS Faculty Retreat in August 2014).

20. Dave Richards: (About the EE program in Everett Community College) Have you reached the community colleges in the Bellevue area in Seattle to recruit students? Have the classes been setup already? Behrooz explained that Francis Wang is actively recruiting in the area and he is in contact with all community colleges, including the colleges in Bellevue.

21. Rob Schauble: Will the classes be live or offline (pre-recorded)? Can the EECS Everett students be transferred to Pullman? Some of the EE courses will be offered at the Everett campus (by the 2 clinical EECS faculty). The will take the other courses online (through AMS) and on Pullman campus. The students that complete the EECS Everett program will receive an EE degree from WSU. The transfer will be seamless.

22. **Computer Science Instructional Labs:** EECS would renovate and reequip the computer instructional lab. In phase-1, the computer lab on the third floor of Sloan will be moved to EME 128 after the renovation of EME 128. EECS has sought feedback from intrustors, teaching assistants and students about the new lab. The new computing lab will be designed and equipped to establish a productive and effective instruction environment.

23. Jon Campbell: The computers outdate pretty quickly these days. Is it worth the investment? You should find out whether your peer schools are investing in such labs. You may consider using Microsoft, Google, Amazon virtual machines instead.

24. If network connectivity is reliable, having cloud virtual machines can be better than purchasing your own workstations.

25. Mike Schroeder [on the phone]: You may buy cloud space and host your machines in that cloud space. The performance of such a scenario needs to be investigated. The two leading companies, Microsoft and Amazon, have sweet deals for educational programs. You should seek quotes from them.

26. Mark Greaves: If the network connectivity is reliable, having cloud virtual machines is a good idea.

27. [Action Item]: Have a discussion with John Yates about the computing equipment for the instructional labs. EECS will consider the available options and make sure that the money is spent on the right solution.

28. Behrooz has asked Executive Councill their feedback about removing Senior Design requirement from the CptS BA program. He explained that EECS would like to remove Senior Design requirement from the CptS BA frogram and have the CptS BA program unaccredited. Several Executive Council members disagreed with this proposal, and they suggested to keep the BA program accredited and make Senior Design courses required for the BA program. [Action Item] Inform CptS Curriculum Committee about the above recommendations. This can be one of the discussion items in the EECS Faculty Retreat in August 2014]

29. Jon Campbell: If you remove Senior Design requirement from the CptS BA program, it will be harder for companies like Microsoft to hire BA graduates. There are already concerns about the quality of the CptS BA graduates.

30. Mark Greaves: Having BA students in the senior design classes would have the benefit of bringing other disciplines into the senior design projects.

31. Time for the fall Executive Council Meeting: Jon Campbell mentioned that the meeting time should not conflict with the career fair. [Action Item]: The meeting time should be setup early, not to have conflicts.

32. Chris Hundhasen gave a presentation on ABET assessment process. [Action Item] Send a copy of the “Assessment Chart” to interested Executive Council members.

33. Dave Richards: You should consider providing examples of good quality software when you teach a programming course or a software engineering course. Student feedback shows that good examples are very effective in teaching.

34. Mark Greaves: You should also focus on teaching students the soft skills. They should learn how to work as a team and resolve issues within the team. You should not let them figure out how to do it on their own. They should learn about building a collaborative environment where they don't avoid the conflict but deal with it in order to effectively work in that environment.

35. Diane Cook presented a research seminar.

36. Dave Richard's comment during Diane's presentation: You should look into the topic of computer accessibility for disabled. For example building devices for disabled (such a blind users). This can be a possible senior design project. Students can design and develop a computer interface which allows accessibility without a GUI. [Action Item] Sakire Arslan Ay will follow up with Dave Richards and Dinae Cook to discuss whether this can be a senior design project for the AY 2014-2015.

37. Matt Taylor presented a research seminar.

38. Anjan Bose presented a research seminar.

39. 2-minute madness presentations: 13 EECS Graduate students gave 2-minute presentations to Executive Council Members about the research projects they are working on. Several members have expressed concern about the formatting of these presentations. They commented that most students have tried to summarize the complete project details within 2 minutes, and haven't successfully communicate the project goal and major accomplishments.

40. Jon Campbell: The presentation should clearly elucidate why the project is important (from the industry perspective) and why the industry should care about those projects.

41. Mark Greaves: The presentations should clearly communicate the technical idea. The technical idea should be given on the slide (should be included in the slide format)

42. [Action Item] "2-minute madness" presentations would be discussed with the faculty in the August 2014 faculty retreat. The minutes of the faculty discussion, and suggestions of the council members will be shared with the EECS graduate students.

43. The meeting was adjourned and the group left for EME to see EECS Senior Design posters.