Assessment of BSEE and BSCptE Programs
2014-15 Cycle

Breakout Session

Our Task for this Session…

- Consider
  - the findings and recommendations that came out of the 2014-15 assessment cycle
  - any unresolved recommendations from previous assessment cycles
- Provide input
- Vote on recommendations as appropriate
- Your ACTIVE participation is appreciated!

Revisit Track Requirements

- Allow for internship/Coop to meet one 3-credit elective in all tracks?
  - Currently the Systems and Microelectronics do not allow it.
- Systems
  - EE 464, 489 (required)
  - EE 432, 451 (pick one)
  - EE 351, 431, 432, 451, 470 (pick two) (add EE 495 here?)
  - EE 470 has not been offered in a while (Fall 3015 offering cancelled)
- Microelectronics
  - EE 351, 476, 496 (required)
  - EE 431, 464, 489 (pick two) (add EE 495 here?)

Revisit Track Requirements

- General track
  - EE 324, 351, 362, 489 (pick one)
  - EE 432, 451, 491, 496 (pick one): this was intended to be a second probability appl. course.
    - we no longer have that in every track
    - EE 491 has dropped probability appl. from syllabus.
    - Suggest we drop this requirement. Merge with the first requirement and “pick two” from merged list?
  - Pick nine credits from list of approved tech. electives.

Revisit Track Requirements: Discussion

- Scribe to take notes

Some juniors/seniors lack basic 200-level concepts

- Are marginal students getting through the system? Is there a subconscious grade inflation? Are we awarding a “C” for what used to be “D”?
- Does repetition of basic concepts in upper-level courses help?
- Do we need more “basic competency tests” --- similar to one in EE 331?
- Any best practices about letting students know “what to expect in the exam”
  - Providing sample exam to students?
  - Providing past exams to students?
  - Providing a list of say ten problems from which to expect?

Some juniors/seniors lack basic 200-level concepts: Discussion

- Scribe to take notes

Java option and impact on EE/CptE curriculum and 4-year degree plan

- See “changes” document as part of the retreat material.
- Approval/Vote needed.

Java option and impact on EE/CptE curriculum and 4-year degree plan: Discussion

- Scribe to take notes.

Java-C module

- Give credit for Java-C module for transfer students
  - CC students usually have10 quarter hours of (Java) programming. This works out to 10x2/3 = 6.7 semester credit hours (rounded to 7).
  - One semester hour credit for the Java-C module will bring the total to 8-semester hours, which is what WSU students have.

Java-C module: Discussion

- Scribe to take notes.

Components of Assessment

- Student Coursework Samples
- Senior Exit Survey
- Professional Skills Discussion
- Junior Writing Portfolio
- Teaching Excellence Committee Report
- Executive Council Discussion
- Faculty Retreat Discussion

Course Assessment Cycle

- Two-year cycle
  - Odd years (e.g., 2015-16 AY), assess ABET outcomes A, B, C, E, H, K
    - EE 214 (ABCEK)
    - EE 321 (ABEK)
    - EE 416 (ACHK)
  - Even years (e.g., 2014-15 AY), assess ABET outcomes D, F, G, I, J
    - EE 234 (G)
    - EE 415 (DFGIJ)
    - EE 416 (DFGIJ)

Course Assessment

- Assessment Committee: Nominally EE and CptE curriculum committee chairs, course instructor. Volunteers welcome!
- Instructor collects student samples corresponding to few course deliverables (e.g., Final exam, Quiz, Lab report) suitable for assessment of targeted outcome(s).
  - Eight student samples for each deliverable.
- Meet week after finals weeks; day or two after grade submission.

Course Assessment

- Everett program is accredited together with the Pullman program. It follows the same assessment process.
- We will initially assess the Everett student work separately to determine whether there are any significant differences.

Coursework assessment: Observations
EE214 (Everett)

- Outcomes assessed: A, B, C, E, K
- Students present labs/projects; TA asks questions based on the design. Feedback is done in an verbal form.
- Projects/labs are important components in our assessment.
  - "Real time" assessment of the course for outcome B.
- Observations are similar to that we made for Pullman in 2013-2014 assessment.

Coursework assessment: Observations
EE 234 (Pullman and Everett)

- Outcome assessed: An ability to communicate effectively (G)
- Some students provided a well-organized and descriptive report. A flowchart was provided to explain the design. The report contained substantial discussion and a listing of the code.
- In some cases, no flowcharts or other graphical illustrations were included; committee noted that a flowchart or pseudo-code would be most suitable for describing the work.
- Recommendation: Provide explicit instructions for the course project report. In particular, emphasize the importance of flowcharts, figures, tables, pseudo-code to explain the design and results of the experiment.
- No significant difference was noted between the Pullman and Everett students in terms of achievement of student outcomes.

Coursework assessment: Observations
EE 321 (Everett)

- Outcome assessed: A, B, E, K
- Midterm test: looked at two problems
  - solving a circuit using differential equation and solving a circuit based on Laplace transform.
  - Students generally did well in the two problems. In a few cases, students obtained an incorrect answer but recognized that the numbers did not make sense. Many students used an incorrect expression for the Laplace transform of a time-varying voltage source.
- Final exam: looked at two problems
  - a transfer function/Bode plot problem and a Fourier series based filtering problem.
  - Most students obtained the correct sketch of the Bode plot; however, the plots were not always fully labeled and could have been sketched more neatly.
  - In the Fourier series based filtering problem there were no conceptual errors although minor calculation errors were found in a few cases.

Coursework assessment: Observations
EE 321 (Everett)

- Design Project:
  - Analyze a third-order circuit using differential equation representation, state-space representation, and transfer function representation.
  - Design a third-order Butterworth low-pass and high-pass filter by suitable choosing circuit parameter values to meet design requirements.
- Observation/Recommendation:
  - No specific concerns about the achievement of outcomes based on assessment of EE 321 at Everett.
  - No significant difference was noted between the Pullman and Everett students in terms of achievement of student outcomes.

Coursework assessment: Observations EE 415/416 (Pullman)

- Outcome assessed: D, F, I, G, J
- Teams consulted faculty members on topics they needed for the design; the level of consultation seems to be uneven.
- All teams included a section on broader impacts in their report. For instance a team that did a project on Hydropower Design with Distributed Generation Analysis considered the impact of the project on fish and wildlife.
- For the most part the reports were neatly done.
- Senior design Poster Competition: Some faculty observations
  - Team was enthusiastic and took turns explaining and were receptive to further enhancements
  - Only one person did all the talking/explaining
  - All team members were knowledgeable and communicated well
  - Team members were very forthcoming with information, and clearly understood the environment in which their design was to be deployed
  - Team seemed quite able to describe the solution that was implemented
- Overall, there was no concern in terms of the technical abilities of the students

Coursework assessment: Observations

- Average (all courses) assessment scores for Pullman

  Unsatisfactory = 1, Needs Improvement = 2, Capable = 3, Exemplary = 4

	Outcome				
	D	F	G	I	J
Score	3.15	2.99	3.0	2.95	3.01

- Average (all courses) assessment scores for Everett

	Outcome					
	A	B	C	E	G	K
Score	3.24	3.15	3.42	3.26	3.5	3.4

- Average (all courses) assessment scores for Pullman (from latest assessment cycle).

	Outcome					
	A	B	C	E	G	K
Score	3.28	3.45	3.04	3.35	3.0	3.34

Coursework assessment: Discussion

- Scribe to take notes.

2015-16 AY: Courses Targeted

- 214 Spring (ABCEK) “Design of Logic Circuits”
- 321 Spring (ABEK) “Electrical Circuits II”
- 416 Spring (ACHK) “Senior Design II”
- If you are teaching a targeted course, please talk to me!

Senior Exit Survey: Jobs, grad. school

Electrical Engineering

- A total of 56 students completed the survey:
  - 21 responses from the Fall, 2014 graduating class
  - 35 responses from Spring, 2015 graduating class
- 91% of graduating seniors had sought employment. Of those:
  - 78% had participated in at least one interview
  - 49% had received at least one job offer, and
  - 41% had actually accepted an offer.
- Five respondents out of 56 (9%) applied to graduate school. All five of them were accepted.

Senior Exit Survey: Jobs, grad. school

Electrical Engineering

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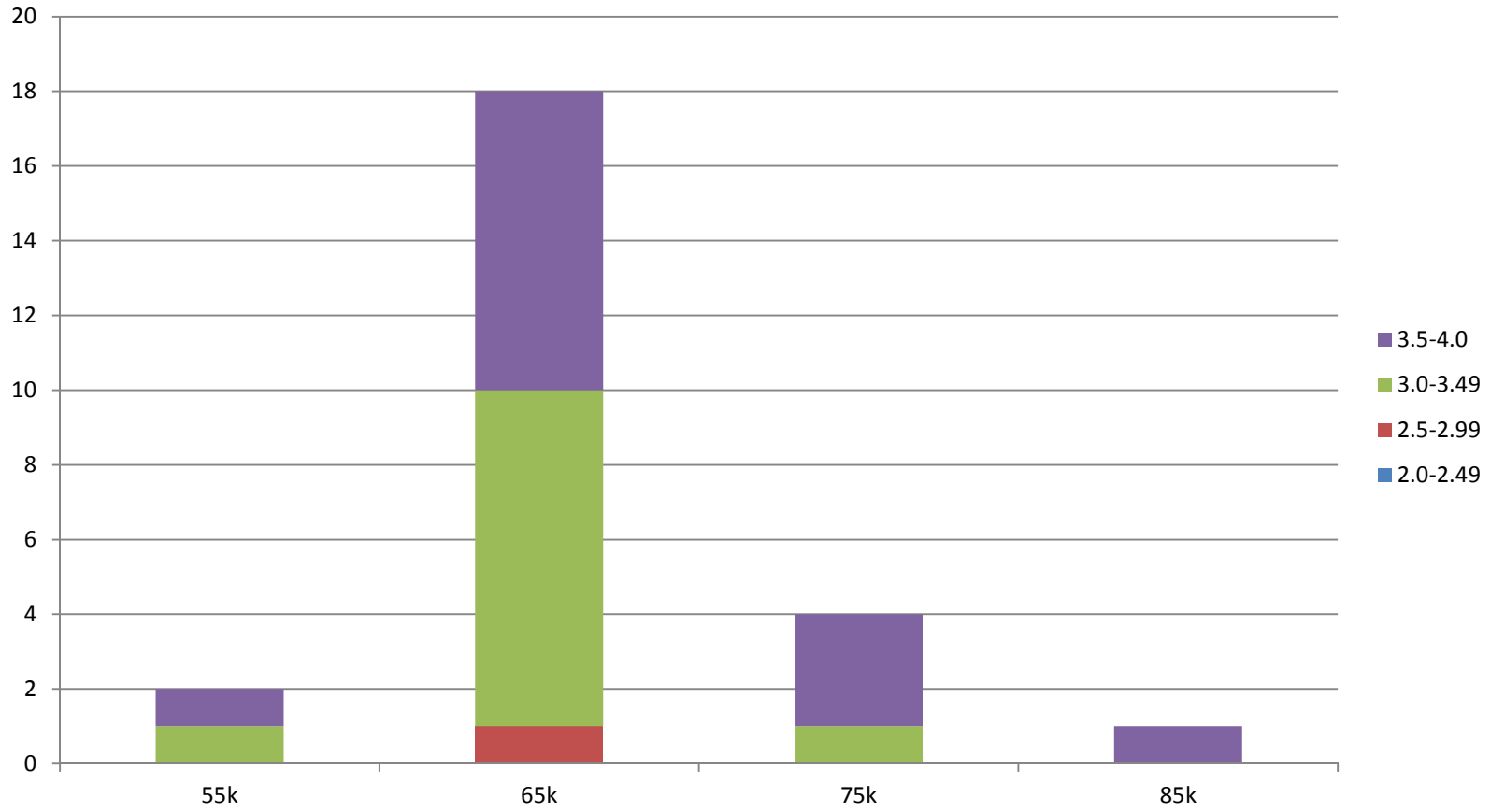
  - 21 responses from the Fall, 2014 graduating class
  - 35 responses from Spring, 2015 graduating class

	Self-reported GPA of graduating students			
Range	2.0-2.49	2.5-2.99	3.0-3.49	3.5-4.0
#Students	1	16	23	16

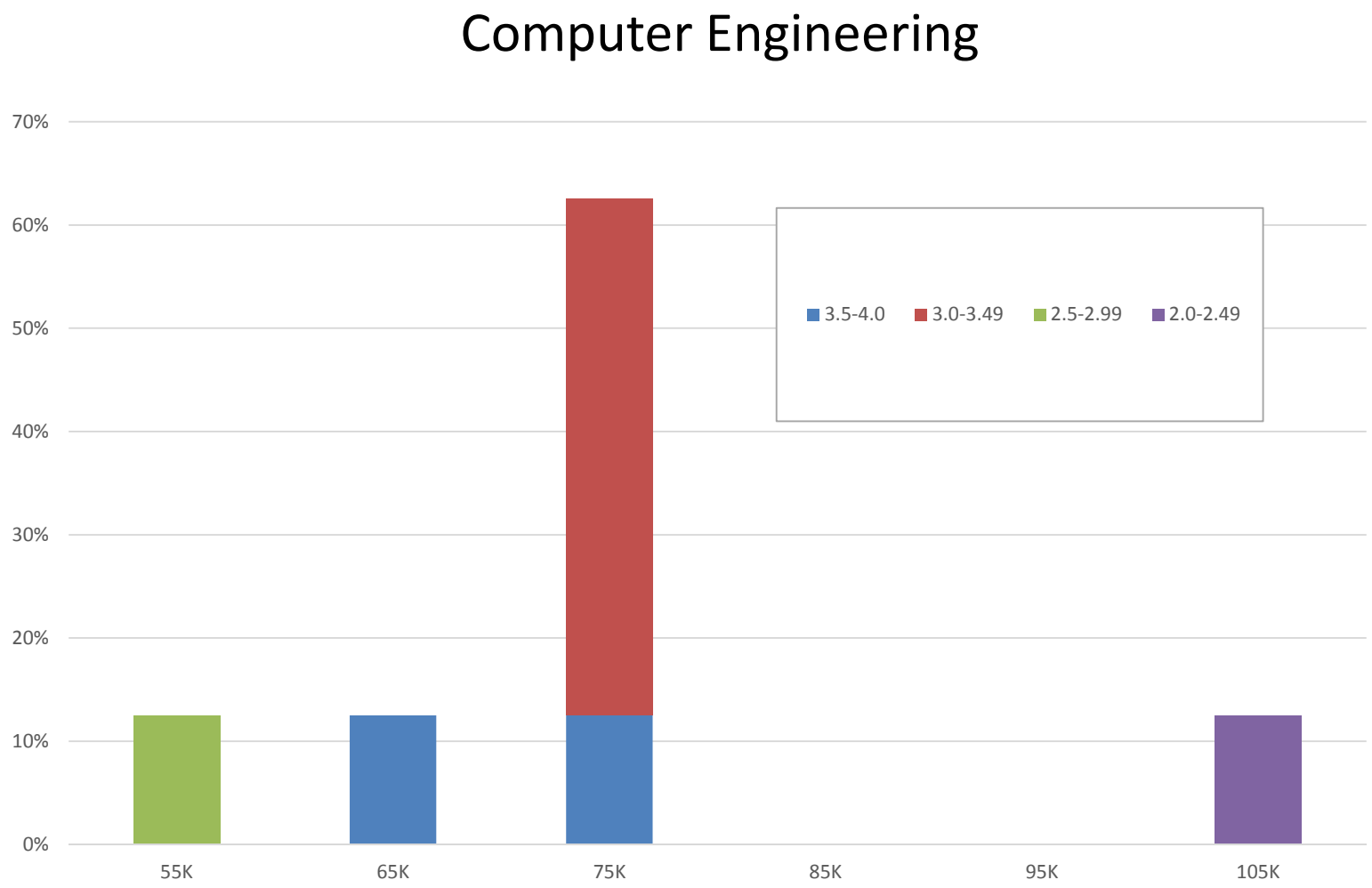
- 91% of graduating seniors had sought employment. Of those:
  - 78% had participated in at least one interview
  - 49% had received at least one job offer, and
  - 41% had actually accepted an offer.
- 100% of graduating seniors with GPA 3.5-4.0 had sought employment. Of those:
  - 94% had participated in at least one interview
  - 81% had received at least one job offer, and
  - 81% had actually accepted an offer.
- Five respondents out of 56 (9%) applied to graduate school. All five of them were accepted.

Salary range reported vs GPA (25 students)

Electrical Engineering



Salary range reported (8 students)



Senior Exit Survey: Jobs, grad. school

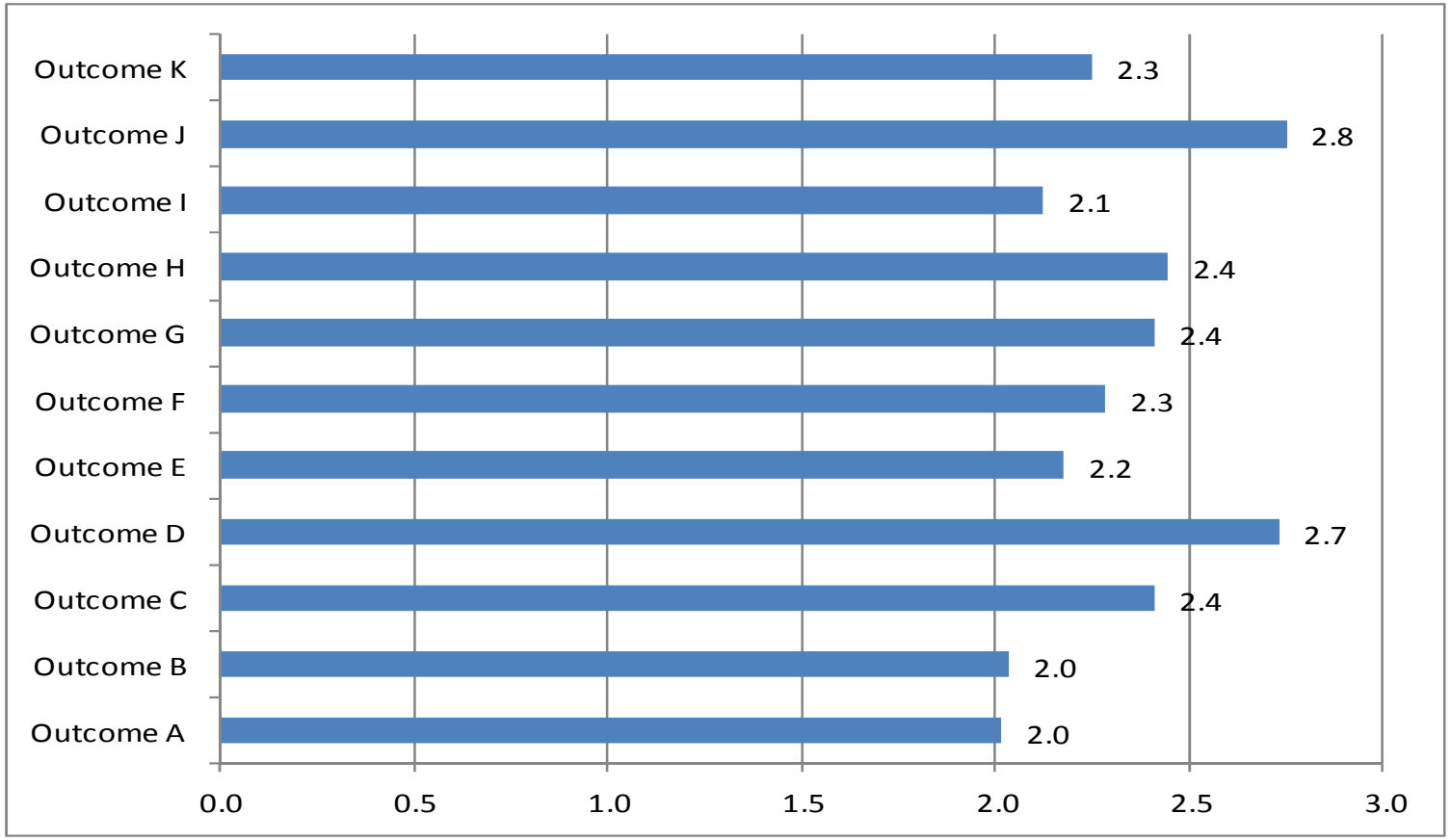
- Nominal goal: 80 percent of our graduating seniors either obtain a job in the field, or are accepted into graduate school.
- Is this goal realistic? Job offers last year were far less than this goal.
- Suggested goals
  - Expect 80% of students seeking jobs having had at least one interview.
  - Expect 80% of our top graduates (A-level students) to have been offered a job at the time of graduation.
  - In 2014-25, 81% of our graduating seniors with GPA above 3.5 had a job offer at the time of graduation.

Senior Exit Survey: Jobs, grad. School Discussion

- Scribe to take notes

Senior Exit Survey: Student Perceptions of Achievement of ABET Outcomes

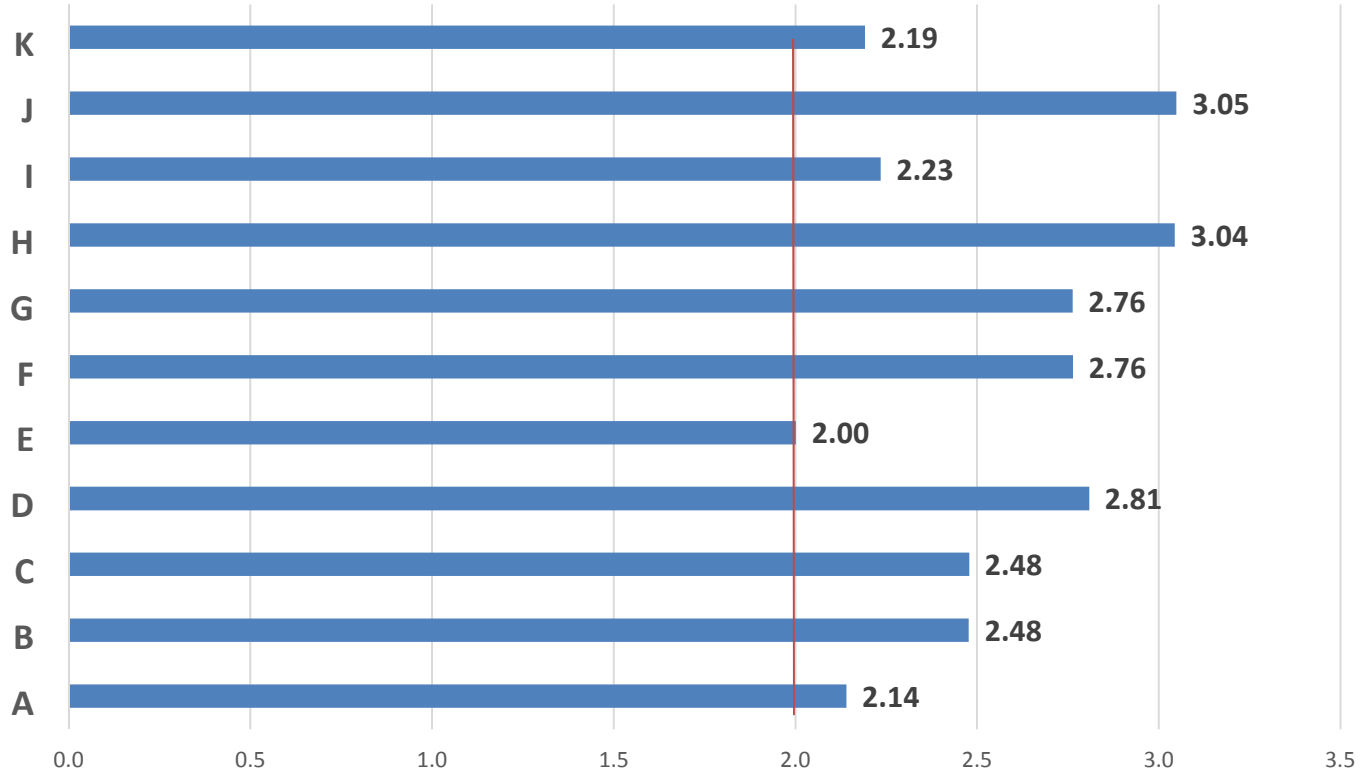
Electrical Engineering



Based on 5-point scale, with 1 being “Excellent” and 5 being “Poor”

Senior Exit Survey: Student Perceptions of Achievement of ABET Outcomes

Computer Engineering



Based on 5-point scale, with 1 being “Excellent” and 5 being “Poor”

Senior Exit Survey: Student Perceptions of Achievement of ABET Outcomes

- Nominal Goal: Average response of 4 or higher in a 5-point scale. In the inverted scale of survey monkey, where 1=Excellent and 5=Poor, this corresponds to a target of 2 or lower.
- Student perception is lower than targeted.
  - Perhaps this is due misalignment of scale.
  - Consider adjusting the wording of scale items in survey to align more closely with our expectations:
  - 1 =“exemplary,” 2 =“capable,” 3 =“needs improvement,” and 4 =“unsatisfactory.”
  - Nominal goal of “capable” or better.

Senior Exit Survey: Student Perceptions of Achievement of ABET Outcomes Discussion

- Scribe to take notes.

Senior Exit Survey: Additional Discussion

- Scribe to take notes.

Professional skills

- Outcome targeted: D, F, I, G
- Teams were able to identify the major issues in the scenario presented (issues such as big government, too much regulation, …).
- A couple of teams provided a good summary of the team's discussion towards the end of the transcript. It was noticed that team skills have been developed, students acknowledge and respect the opinion of others and they added to the conversation.
- For the most part, students were aware of contemporary issues. They also draw some analogies with electricity and past controversial regulations such AT&T breakout and clean water act.
- Student in general were aware that they need to know much more to provide a meaningful solution; learning on topics such the FCC, how commissions are appointed, etc.
- Average assessment scores for Pullman

Unsatisfactory = 1, Needs Improvement = 2, Capable = 3, Exemplary = 4

	Outcome			
	D	F	I	J
Score	3.15	2.99	2.95	2.91

Junior Writing Portfolio

- No updated results from Writing Center.

Junior Writing Portfolio Discussion

- Scribe to take notes.

Teaching Excellence Report

- The last report for the calendar year 2014
- An observation related to BSEE & BSCptE programs from 2013
  - "In EE 416 there were concerns about its structure. A few students mentioned it has soured their experiences/image with/of the EECS program."
  - No concern noted this time.
- EE416/CptS 423: Consider having EE and CS project judging done separately. Some CS students don't think the current system is fair.
- TAs for CptS 121 and 122 need to be chosen with care. TA selection has a huge impact on the students as implied by the comments.

Teaching Excellence Report Discussion

- Scribe to take notes.

Executive Council Discussions

- EECS Executive Council met on April 22, 2015
- Align CptS/EE 302 course topics with the "Fundamentals of Engineering" exam—the first step in the process leading to the Professional Engineer license. Note that this exam exists for electrical and computer engineering, but not for computer science.
- In CptS/EE 302, discuss recent cases relevant to security and privacy issues. Members of the EC can provide additional input on how to improve CptS/EE 302.
- Define criteria that faculty mentors can use to evaluate junior instructors.

Executive Council Discussions
Faculty discussion

- Scribe to take notes.

Additional discussion

- Scribe to take notes.