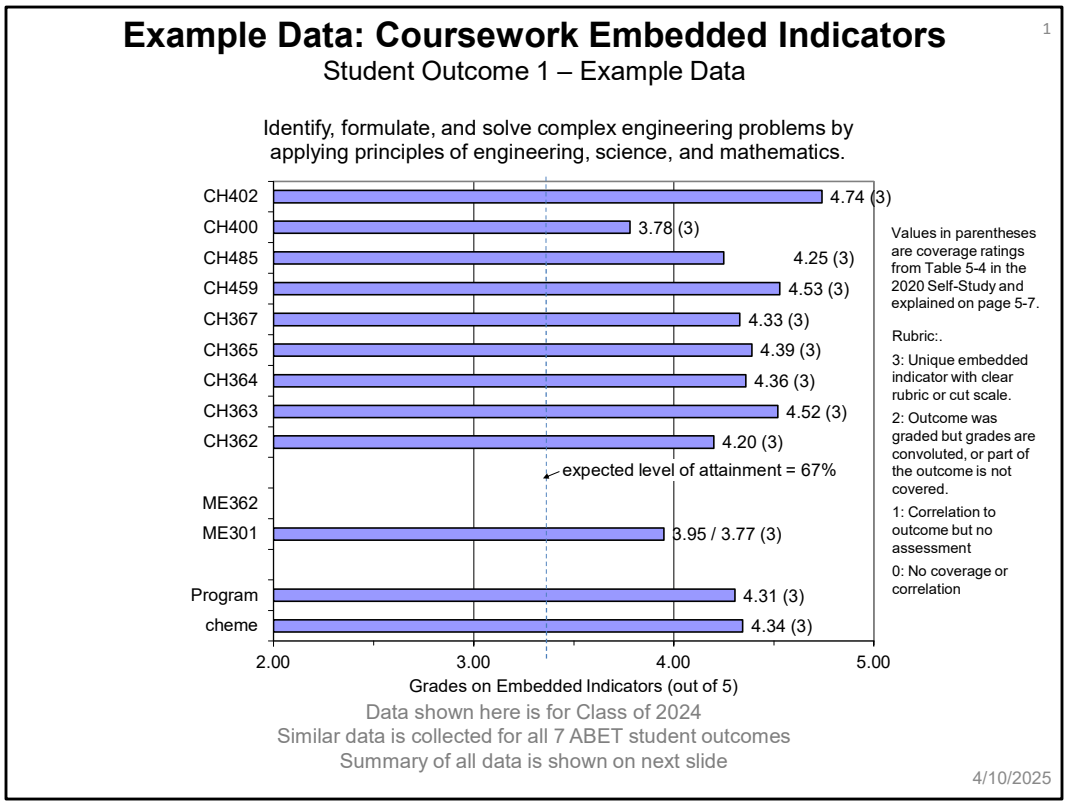
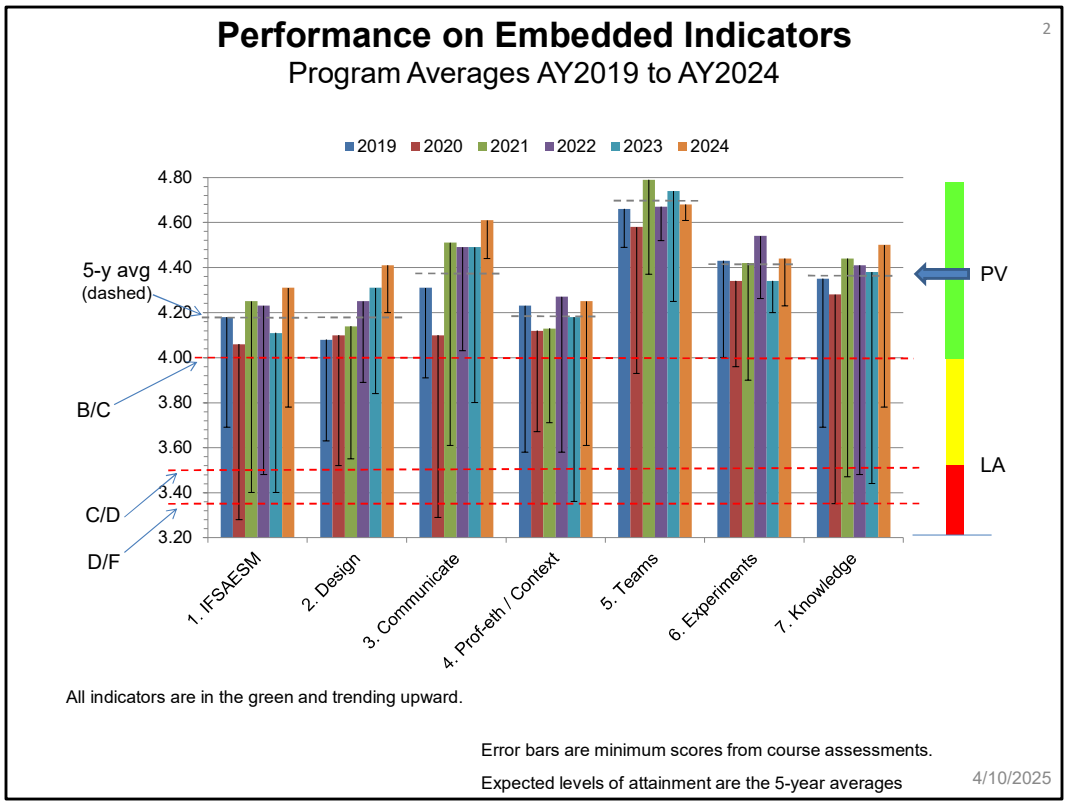
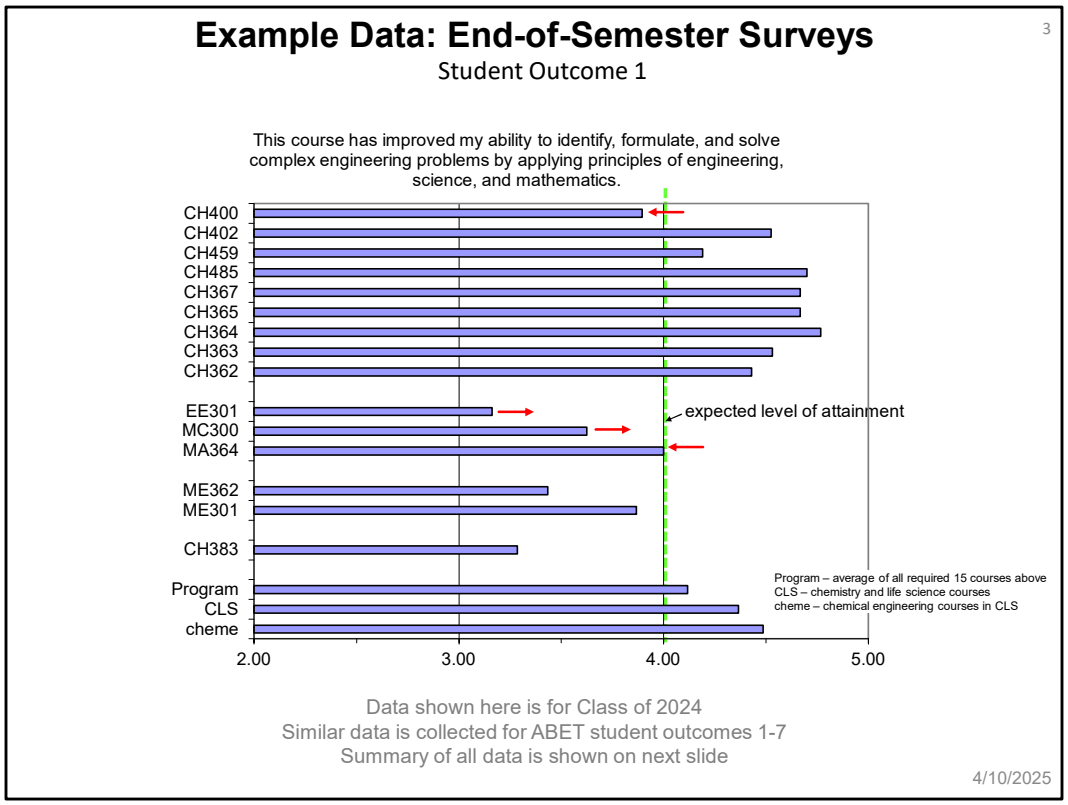


Slide updated 31 July 2024. This slide shows the embedded indicator results from the courses (from the 1/0 spreadsheets) for student outcome 1. These results are averages for graded events in the courses that assess this outcome. The values at the bottom of the chart are for comparison and are averages for all program courses (CE+ME) and for CE courses only. The values in parentheses are coverage ratings determined after careful analysis of the indicators determined with the rubric shown. The line indicating level of attainment is the D/F cutoff per standard Dean's cut scale (i.e., 66.7% or 3.33 out of 5). Mechanical engineering courses have two scores, the first being for chemical engineering cadets and the second is the course-wide average. The complete set of data for all student outcomes is included in the program assessment data packet.

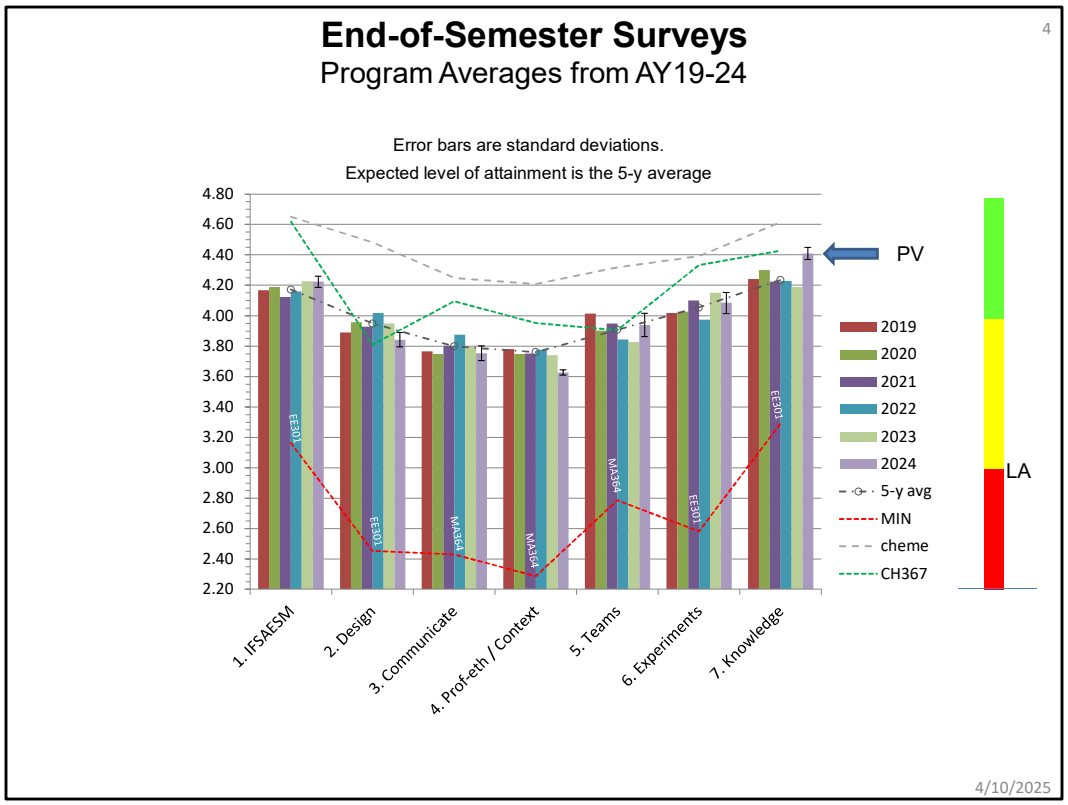
Note: Mechanical engineering courses have two scores, one for chemical engineering students and one course-wide.



Slide updated 31 July 2024. Program averages are shown for all courses containing embedded indicators. The green, yellow, and red bars on the right mimic a process control indicator, where the 2024 score (orange vertical data bar) is the measured process variable (PV), and the 5-year average is our performance goal (gray dotted line). The “low alarm” is indicated with “LA” and would trigger program (process) response. In the language of process control, our process is “in the green” for all outcomes. The error bars are minimum scores from courses. For example, the orange bar for 2024 in outcome 1 shows a minimum score of 3.78, from CH400 on the previous slide (slide 1).



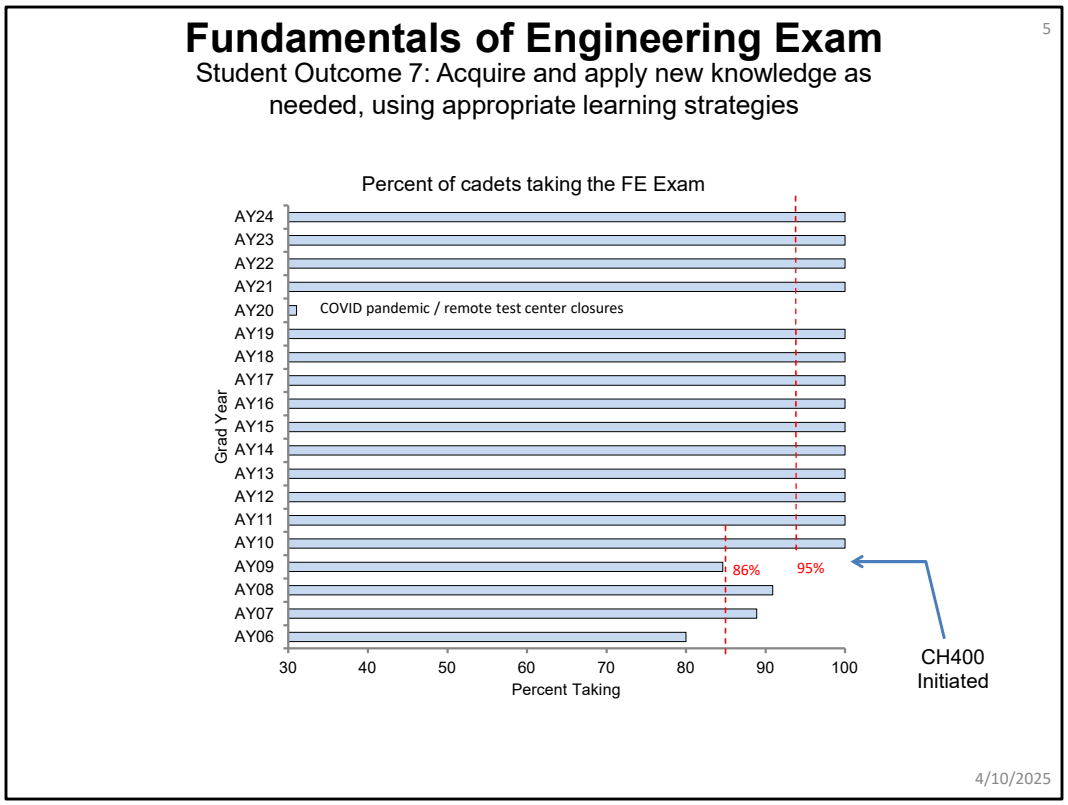
Slide updated 28 May 2024. At the end of each semester, cadets are asked how their current courses contributed to the student outcomes (self-perception of their abilities in each ABET student outcome). We call this the "end-of-semester" survey. The line indicating the expected level of attainment is 4.0 on the survey, which is a standard "good" score on a 1-5 Likert scale and is also about equal to the survey average over the previous 5 years (4.24/5.00). The summary data on the next slide shows averages of this data from all courses for each outcome, and the complete set of data is shown in the program assessment data packet. The red arrows indicate large changes from last year (>~±0.5).



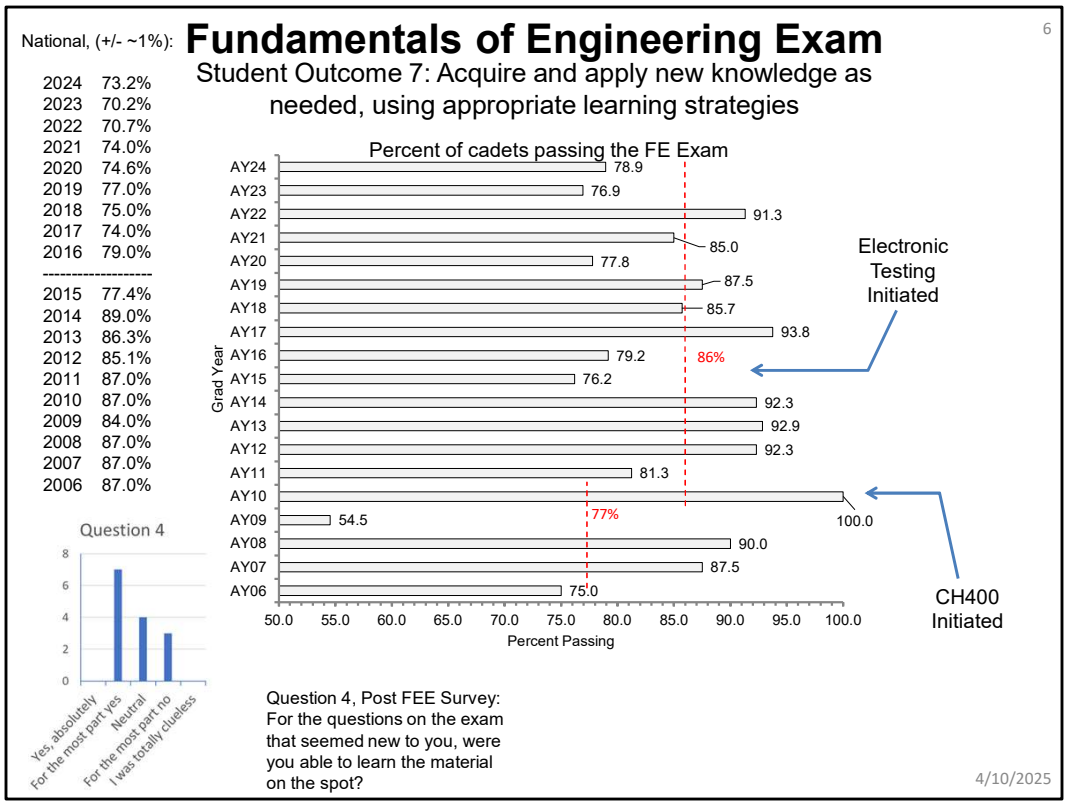
Slide updated 28 May 2024. At the end of each semester, cadets are asked how their courses contributed to the student outcomes (self-perception of their abilities in each ABET 1-7 student outcome). We call this the end-of-semester "student outcomes survey." Individual data are shown in the program assessment data packets, and an example for a single student outcome (outcome 1) is shown on the previous slide. To analyze year-to-year trends, this slide (slide 4) shows the yearly averages of the survey results for all outcomes, with each outcome averaged over all courses. Survey results are "normalized" by subtracting survey averages to remove year-to-year bias. The five-year average (5-y avg) is shown for comparison. The chemical engineering courses in the department (cheme) are also shown for comparison. The minimum scores in each outcome are shown by the red dotted line.

The red dotted line represents the minimum score in the survey, (in order, EE301, EE301, EE301, EE301, CH383, EE301, and EE301). These courses tend to change year-to-year. In AY23 (one year ago), for example, the minimum scores were dominated by EE301, and in AY22 (two years ago), the minimum scores were dominated by MC300. Prior to 2019, the controls course (XE472) was the lowest course in the survey and was also the minimum in each outcome every year. The new controls course (CH367, dotted green line), is now significantly higher and near the average for the chemical engineering courses in D/CLS.

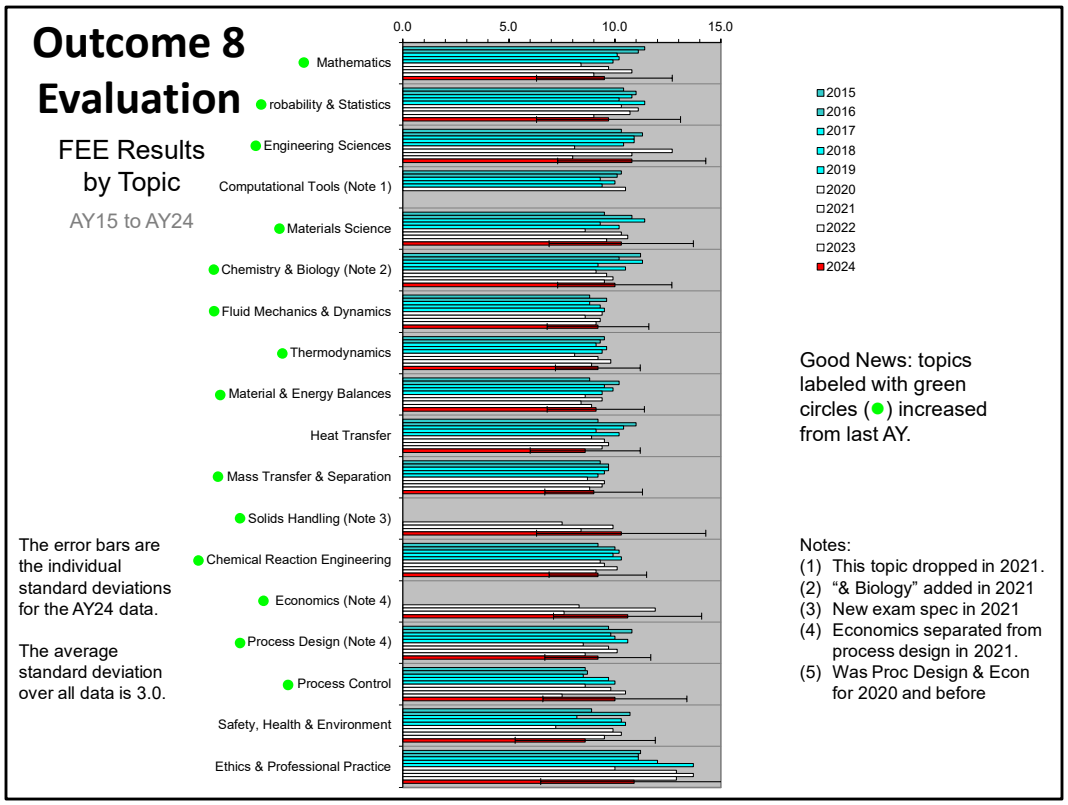
The green, yellow, and red bars on the right are meant to mimic a process control indicator, where the 2024 score is the measured process variable (PV) and the 5-year average is our comparison point. For example, in student outcome 7, the 2024 value is above the 5-year average 4.41 versus 4.24. In the language of process control, our indicator is "in the green" if we are at or above the 5-year average The "low alarm" is indicated with "LA" and would trigger some kind of process response. For example, introducing CH367 was a response to low alarm in the process control course (XE472) which was consistent over many years. We are mostly "in the green" for AY24, with outcome 4 being somewhat low.



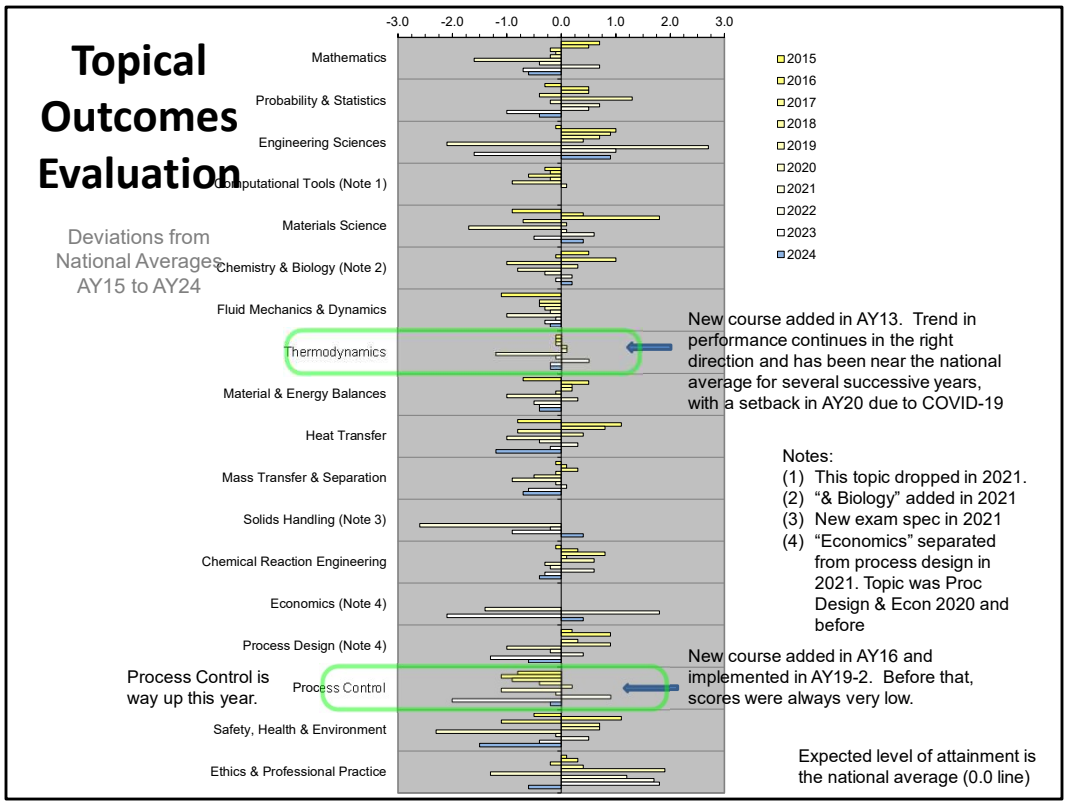
Slide updated 25 July 2024. The percentage of cadets taking the exam is associated with willingness to pursue professional licensure and career development and is a marker of recognition of the needs for life-long learning. The drop in AY20 was due to closure of the NCEES test centers during the COVID-19 pandemic.



Slide updated 10 April 2023. The percentage of cadets passing the FE exam is associated with cadets' ability to identify, formulate, and solve complex engineering problems by applying principles of engineering, science, and mathematics.



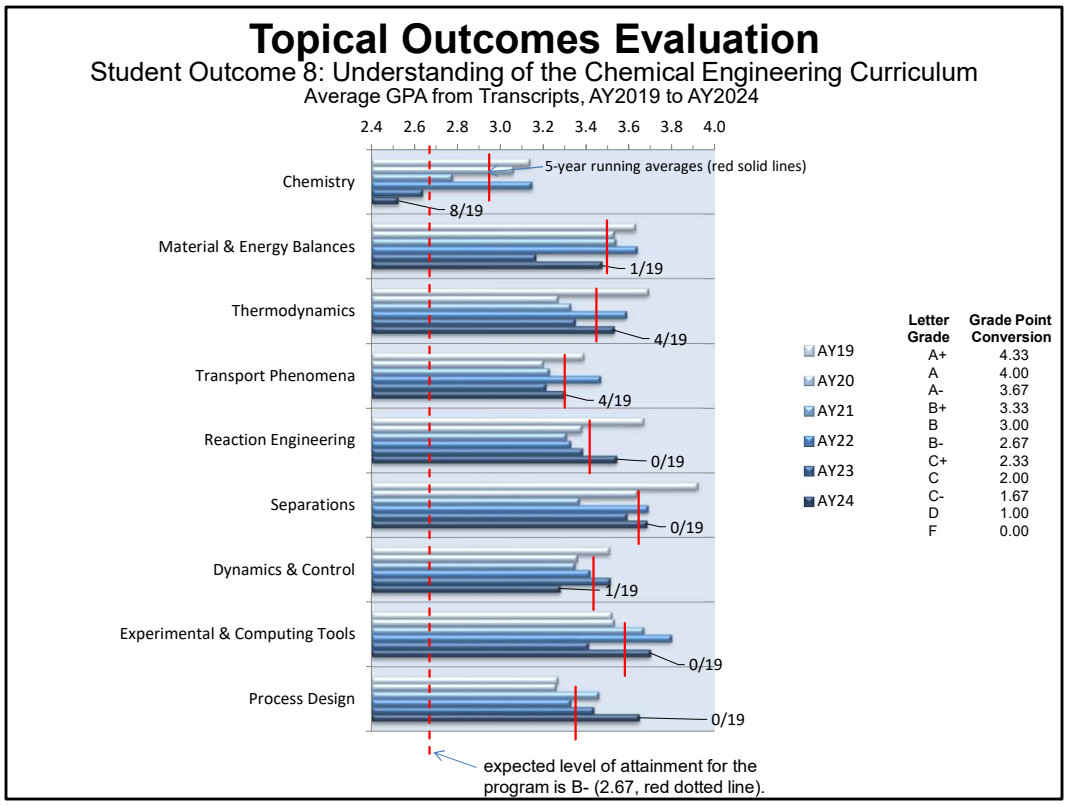
Slide updated 25 July 2024. This data is contained in the report we receive each year from NCEES. Cadet scores are reported to us as an average performance index, which is a normalized score on a scale of 0 to 15.



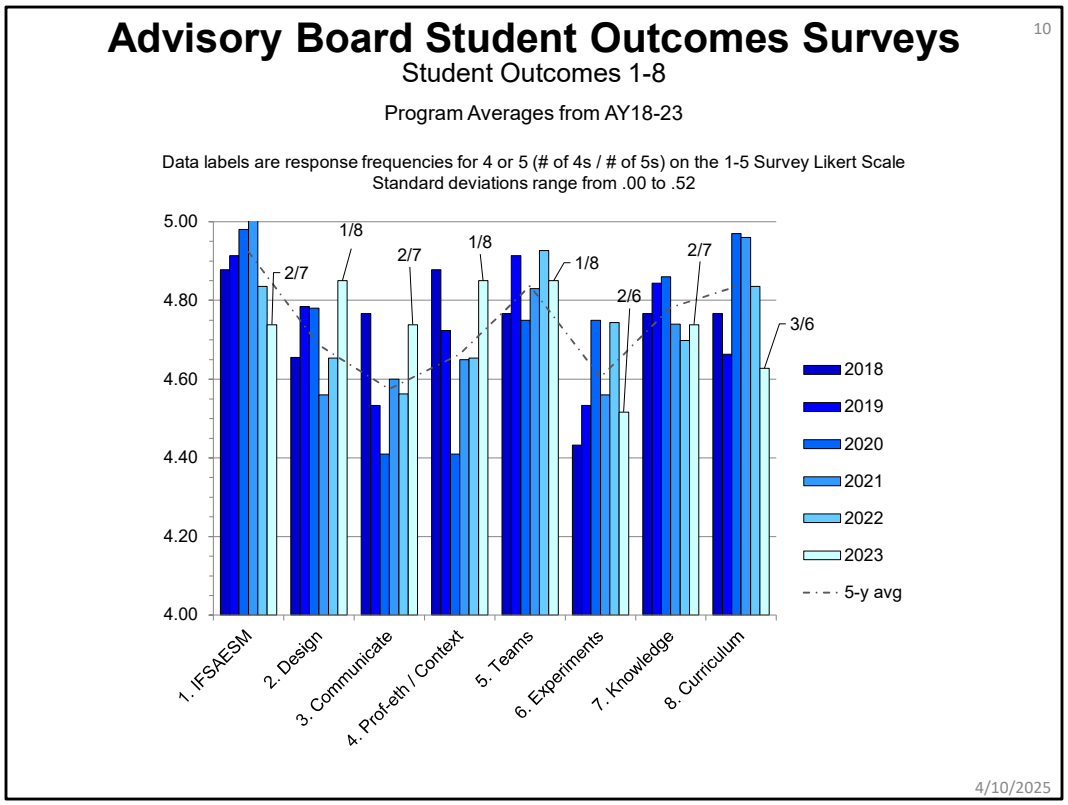
Slide updated 11 July 2023. The slide shows normalized FEE data, broken down by subject.

Scores are near the national average in Thermodynamics for the last two years. Process control is near the national average but the score is way up this year. These two are important because they show we are attempting to improve cadet performance on our student outcomes. In the ABET assessment process, we must demonstrate that we are assessing performance and that we are responding to performance indicators. We must also demonstrate that the department is willing to commit resources to the improvement process. These two features form the heart of the ABET process. The addition of these two courses demonstrates our effort to achieves this. We also have documentary evidence to show exactly why we made the changes.

While we are not required to show improvement, we are required to track progress to see if improvement occurs.



Slide updated 28 May 2024. This slide contains averages of course letter grades in the topic-specific courses in the program, as obtained from each cadet's final transcript. The averages are shown as a grade point averages (GPA). The GPA scale is 0 to 4.33, as shown in the table at far right. The expected level of attainment in the program is 2.67 (B-, red dotted line), and the 5-year running average for the previous five years is shown as red solid lines. Data labels (e.g. 8/19) are the number of students below B- (C+ or lower).



Slide updated 28 May 2024. The chemical engineering advisory board is asked to rate performance of cadets on student outcomes, based on data presented to the board at the advisory board meetings. Data for AY2018 to AY2023 is shown here after the most recent advisory board meeting on 14-15 April 2024. Data for AY2024 are not available until after the advisory board meeting in spring of 2025. Data are normalized to compensate for year-to-year fluctuations in the survey average, which places all survey years and board compositions on the same basis. Data labels are response frequencies for 4 or 5 (# of 4s / # of 5s) on the 1-5 survey Likert scale. For example, in outcome 1 IFSAESM, 7 out of 9 board members responded with a 5 and there were two responses of 4, so the label is 2/7. Outcomes 2, 3, and 4 were relative lows last year and are up this year, and outcome 6 is the relative low. The five-year average is the dotted line.