College of Business and Technology

Division or Department: Engineering and Technology (IET, BS)

Prepared by: Nabin Sapkota/Jafar Al-Sharab　　　　**Date: 6/16/2018**

Approved by: Margaret Kilcoyne　　　　　　　　**Date: 21 June 2018**

Northwestern Mission. Northwestern State University is a responsive, student-oriented institution that is committed to the creation, dissemination, and acquisition of knowledge through teaching, research, and service. The University maintains as its highest priority excellence in teaching in graduate and undergraduate programs. Northwestern State University prepares its students to become productive members of society and promotes economic development and improvements in the quality of life of the citizens in its region.

College of Business and Technology Mission. The College of Business and Technology is dedicated to providing a high quality – market responsive business and technology education, preparing our diverse student population for successful careers and enriched lives in the public, private and nonprofit sectors, and enhancing our students' academic experiences through our research and scholarly activities. (Adopted September 28, 2015, 04/13/2018)

Engineering Technology Department Mission:　 The Engineering Technology Department is dedicated to delivering high quality education in the areas of engineering technology, electronics engineering technology, and industrial engineering technology, as well as pre-engineering preparation. The department prepares students for successful careers and enriched lives in the public, private and nonprofit sectors, and promotes economic development and enrichment of the communities we serve.

Industrial Engineering Technology Mission Statement: The mission of BS in Industrial Engineering Technology is to produce four-year graduates with the breadth and depth of knowledge in industrial engineering technology to become lifelong productive members of the regional workforce and the local society.

Purpose: The Bachelor of Science in Industrial Engineering Technology program will prepare students to: 1) Analyze, test, build, operate and maintain industrial systems (equipment, warehouse operations, safety management, plant operations, etc.), and 2) Manage manufacturing facilities, systems and operations to include installation, motion and time, safety and efficiency. It prepares students for entry positions in government and the private sector in which the ability to implement changes, upgrade operations, set- up equipment, analyze problems, and modify if necessary is increasingly critical. It will also prepare interested students for the pursuit of advanced degrees in Engineering and Technology at other institutions.

Methodology: The assessment process for the BS in Industrial Engineering Technology program is as follows:

(1) Data from assessment tools (both direct – indirect, quantitative and qualitative) are collected and returned to the department head and ET ABET committee

(2) The department head and ET ABET committee analyze the data to determine whether students have met measurable outcomes

(3) Results from the assessment are discussed with the program faculty
(4) The department head, in consultation with the Engineering Technology Advisory Board, will propose changes to measurable outcomes, assessment tools for the next assessment period and, where needed, curricula and program changes.

Student Learning Outcomes (SLOs):

Student learning outcome data was collected, analyzed, and reported for the Industrial Engineering Technology degree program. Measures used to collect data include, reports, case studies, projects, exams, presentations, and written exercises. Assessment data for academic year 2017-2018 show that targets were met or exceeded. Most of the students' performance indices for all SLOs were found to be satisfactory.

From these results, there were several key actions recommended and decisions made to enhance the student experience and student-learning outcomes with the focus on assuring students meet and exceed target expectations.

SLO 1. Ability to apply the industrial engineering technology knowledge, skills, and tools to real-world problem solving (ETAC of ABET Outcome a).

Course Map: Tied to course syllabus objectives.

IET 2020: METALS MACHINING I
EET 4950 or IET 4960: PROJECT DESIGN II

Measure 1.1. (Direct – Knowledge)

Every spring semester, students' grades on the IET 2020 final exam are used to assess the attainment of SLO 1. The acceptable target is 80% of students scoring a C or better on the final examination.

Finding: The target was met.

Analysis: 31 out 36 (86%) students scored a C or better on the final exam in AY 17-18. In AY 16-17 (24 out of 27, 88.89%) students scored a C or better on the final exam. The AY 17-18 results decreased slightly (2.89%) from the prior year.

Based on the success AY 16-17 assessment results, the instructor decided to introduce G-code programming in greater depth during AY 17-18. This would introduce greater challenge and enhance learning in the course. Therefore, on the final exam, one major test question asked students to write machine programming in G-code. However, some students struggled with this item and the assessment results were slightly lower than last year. While the new skill was meant to increase student learning, it may have caused the slight fluctuation in year-to-year performance.

Another reason for the fluctuation could be the larger class size in AY 17-18. Two sections of IET 2020 were merged at the last moment because one of the professors teaching the course moved to an administrative position within the department. Since IET 2020 is a lab-based course, one-on-one, hands-on experience working with the machinery is required. Since the supply of machines is limited, class size is especially important.

Action - Decision or Recommendation: The target was met with a performance index of 86% for second year in a row. The assessment results were discussed with IET faculty. The following recommendations were made:

> a) More G-code programming examples and practice problems should be introduced to the students in AY 18-19, and
> b) Class size should be restricted to 25 students.

Measure 1.2. (Indirect – Knowledge/Ability/Skill)

Every semester, upon presentation of capstone projects, ET faculty evaluate student performance with respect to the ability to apply industrial engineering technology knowledge, skills, and tools to real-world problem solving. The acceptable target is 80% of IET students rating at least a 4 out of 7.

Finding: The target was met.

Analysis: In AY 17-18, the overall results were that 27 out of 27 (100%) students scored a C or better on the oral presentation in IET 4960. Meanwhile, in AY 16-17, the overall results were that 22 out of 22 (100%) students scored a C or better on the oral presentation in IET 4960. As compared to AY 16-17, student performance was retained at 100% level. The target was met. In a year-to-year comparison, results were stable. The target was met in both years, and the target was met in both academic cycles.

On a semester-to semester-basis in AY 17-18, in IET 4960, students scored a C or better on the oral presentation in IET 4960 as follows:

- Fall 2017, 11/11 (100%)
- Spring 2018, 19/19 (100%).

On a semester-to semester-basis in AY 16-17, in IET 4960, students scored a C or better on the oral presentation in IET 4960 as follows:

- Fall 2016, 9/9 (100%)
- Spring 2017, 13/13 (100%)

The trend of 100% achievement was maintained by our students in the AY 17-18 assessment cycle. Based on results from the AY 16-17 assessment, the instructor introduced "mock" presentations as a required activity for the students in AY 17-18.

In addition to proper guidance and support from the course faculty, students are prepared throughout the program for this presentation. They have to take four different English courses including technical writing as well as a communication course. It was our assessment that the students' performance in this SLO is the combined result of preparation in students' coursework and teamwork across the curriculum in addition to the diligent work and support from all faculty involved, including the instructor of the course. By the time students get to this course, they should be well-versed in written and verbal communication, but the addition of the mock presentations in AY 17-18 gave them a chance to practice public speaking several times as they get ready to present their capstone projects. In review, the faculty feel that the mock presentations were a benefit to student learning and skills, and they helped maintain the successful results for this measure over the last assessment cycle.

Action - Decision or Recommendation: The target was met for with a performance index of 100%. The assessment results were discussed among IET faculty. This is a senior design project course where teamwork is emphasized along with the ability to apply the body of knowledge learned in 3½ years of study. It was recommended to continue "mock" presentations several times before the actual presentation. The faculty will also be vigilant of other pedagogical methods to improve student presentation skills. For example, faculty will review rubrics and presentation criteria from other disciplines, such as business, for possible ways to improve our own presentation rubrics or increase the rigor of the presentation grading. These practices will contribute to our drive for continuous improvement in the IET program.

SLO 2. Ability to perform tests, measurements and experiments (ETAC of ABET Outcome b).

Course Map: Tied to course syllabus objectives.

IET 3570: ENGINEERING ECONOMICS
IET 4700: MANUFACTURING FACILITIES

Measure 2.1. (Direct – Knowledge/Skills)

Every spring semester, students' grades on the IET 3570 (Engineering Economics) final exam are used to assess the attainment of SLO 2. The acceptable target is 80% of students scoring a C or better on the final examination.

Finding: The target was met.

Analysis: The acceptable target was met and exceeded. 37 out of 41 (90%) students scored a C or better on the final examination. In AY 16-17, 30 out of 35 students (86%) scored a C or better on the final examination. The slight decrease (-4%) in positive results could be a random phenomenon.

Based on the AY 16-17 assessment results, the instructor of the course introduced more problems in the class. These problems were targeted to address student deficiencies that were discovered in the AY 16-17. Besides, holding a comprehensive exam review session before the final, students were encouraged to utilize faculty office hours for one-on-one tutorial sessions. These changes were introduced to enhance student learning as well as a better student experience through one-one-one interaction with faculty members.

Action - Decision or Recommendation: The target was met with a performance index of 90%, and results from the assessment were discussed with IET faculty. To enhance students' skills in problem solving, it was recommended to introduce Microsoft Excel and Macros in the future classes. Based on discussion with the faculty teaching this course, it was agreed that using Microsoft Excel for financial problem solving would be a good tool to introduce in this course, IET 3570 Engineering Economics.

Measure 2.2. (Direct – Knowledge/ Skill)

Every spring semester, students' grades on the IET 4700 final exam are used to assess the attainment of SLO 2. The acceptable target is 80% of students scoring a C or better on embedded questions.

Finding: The target was met.

Analysis: In AY 17-18, 28 out of 28 (100%) of students scored a C or better on embedded questions and assignments. However, in AY 16-17, only 23 out of 28 (82%) of students scored a C or better on the embedded questions and assignments. The performance index for AY 17-18 increased by 18% over that of AY 16-17 (82% to 100%). The target was met in both years, but overall evidence of student learning was much better in AY 17-18.

Upon discussing the AY 16-17 assessment results with the IET faculty, it was evident that in AY 17-18, a comprehensive exam review should be done before the final. This plan was executed and the increase in the performance index was likely positively affected by the review session.

Action - Decision or Recommendation: The target was met with a performance index of 100%. The results from the assessment were discussed with IET faculty. It was recommended to continue the practice of providing a comprehensive review before the final exam as well as continuing to monitor exam results for deficiencies in student performance each semester. As AY 17-18 was the first year that the review session was instituted, future academic data will determine whether additional revisions or content to the measure, the exam material, or the review session are necessary.

Measure 2.3. (Direct – Knowledge/ Skill)

Every spring semester, students' grades on the IET 4700 Design Project are used to assess the attainment of SLO 2. The acceptable target is 85% of students scoring a B or better on the Team Timed Lighting design project.

Finding: The target was met.

Analysis: In AY 17-18, 25 out of 28 (89%) students scored a B or better on the Team Timed Lighting design project. However, in AY 16-17, 28 out of 28 (100%) of students scored a B or better on the Team Timed Lighting design project. While the target was met in both years, student achievement decreased from year-to-year.

The slight decrease in student performance was due to one group of three students who could not finish the design project satisfactorily. Students in this group were frequently absent in the class and after repeated interventions with the students about their attendance, they did not improve their attendance behavior.

Overall, the performance index is acceptable and satisfactory, and the faculty took appropriate measures to encourage student attendance.

Action - Decision or Recommendation: The target was met and results from the AY 17-18 assessment were discussed with IET faculty. In the future, faculty will place greater emphasis on students being punctual and aware of their responsibilities, especially concerning the group project. This emphasis will be stressed early in the semester and at regular intervals. Further, group formation for the experiments will be supervised by the instructor to avoid "students only" initiated group formation. In addition, when necessary, instructors will intervene during group formation to avoid uneven group skill or behavior.

SLO 3. Ability to conduct continuous improvement projects (ETAC of ABET Outcome c).

Course Map: Tied to course syllabus objectives.

IET 3150: FLUID POWER
IET 3510: MOTION AND TIME STUDY

Measure 3.1. (Direct – Knowledge/Skills)

Every fall semester, students' grades on the IET 3150 Fluid Power circuit experiment are used to assess the attainment of SLO 3. The acceptable target is 80% of students scoring a C or better on fluid-power circuit experiment.

Finding: The target was not met.

Analysis: In AY 17-18, 21 out of 28 (75%) students scored a C or better on the fluid-power circuit experiment. In AY 16-17, 24 out of 25 (96%) students scored a C or better on the fluid-power circuit experiment. Therefore, student performance decreased in AY 17-18, and the target was not met.

Based on the assessment data from AY 16-17, the instructor of the course introduced relatively difficult problems for the experiment to increase course rigor and enhance student learning. The increase in difficulty presents a likely cause for the declining year-to-year results. However, the decline could be caused by the combined effect of the difficult problems as well as the way student group-formation for this project was carried out.

When the groups were created in one of the classes, a few late arrivals joined the same groups, and it so happened that the majority of those students often received average or below average grades. Overall, performance of these groups did not exceed the requirement of a "C" grade for the project.

Action - Decision or Recommendation: The target was not met, and results from the assessment were discussed with IET faculty. It was recommended that the faculty should supervise student group-formation in class to prohibit too many late-comers and absentees being assigned to one or two groups. Next time, when the groups are formed, group formation will be given greater attention in order to avoid a repeat of this incident. The faculty also recommended covering difficult problems with several examples so that the students will have sufficient experience and knowledge to solve similar problems on the tests.

Measure 3.2. (Direct – Knowledge/Skills)

Every fall semester, students' grades on the IET 3510 Final Project are used to assess the attainment of SLO 3. The acceptable target is a final class project rated at 70% or better by the client and faculty.

Finding: The target was met.

Analysis: In AY 17-18, 28 out of 33 (85%) were rated at 70% or better by the client and faculty. The target was met. Meanwhile, in AY 16-17, the performance index was 26 out of 30 (86%) rated 70% or better by the client and faculty. The target was met both years, and the results were nearly identical year-to-year.

Based on the AY 16-17 assessment and experience in the classroom, the faculty assigned students their semester project in a timelier manner. Finding the adequate number of semester projects in timely manner is difficult as it requires participation from clients (industrial partners outside of the university). Therefore, the faculty made an effort to find industrial partner clients earlier in the academic year than in prior years. This gave the students more time to ruminate on the projects and gain more experience working with real-world clients.

The slight decrease in performance is potentially due to one group of international students who were also majoring in music. The project required visiting a client's facility multiple times to make observations. Since these students were all busy preparing for the university's Christmas Gala, they could not find enough time to make good observations, an analysis, and a report. The annual Christmas Gala is a major undertaking by various music and creative arts programs on campus.

Action - Decision or Recommendation: The target was met and results from the AY 17-18 assessment were discussed with IET faculty. To avoid the "Christmas Gala" timing conflict that developed, the faculty decided not to accept all student-initiated groups. The instructor should intervene during group formation to ensure that groups can manage their project responsibilities and to check for a potential reoccurrence of the "Christmas Gala" timing conflict as participation in the gala may not be limited to music majors. The faculty will work to build student groups with diversity (local, national and international students) and different educational workloads so that each group will manage their team responsibility and could timely deliver the expectations of the project. Implementation of this plan will start in Fall 2018, as this is a fall-only course.

In addition, to better clarify about the group project and involved processes, the instructor will explain expectations and responsibilities for the semester project to the students early in the semester and mention events, such as the Christmas Gala, sporting events, etc., and suggest that students involved in these events begin their projects as soon as possible. Written changes to the syllabus, Moodle posts, or additions to the project instructions will also be considered so that students will have a written reminder of the importance of getting an early start and balancing their outside projects with their coursework.

SLO 4. Ability to function effectively on a team (ETAC of ABET Outcome d).

Course Map: Tied to course syllabus objectives.

EET 4940: PROJECT DESIGN I
EET 4950 or IET 4960: PROJECT DESIGN II

Measure 4.1. (Indirect – Knowledge/Ability/Skill)

Every semester, upon presentation of capstone projects (both Project Design I EET 4940 and II IET 4960), ET faculty evaluate student performance with respect to the ability to function effectively on a team. The acceptable target is 80% of IET students rating at least a 4 out of 7.

Finding: The target was met.

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Analysis: In AY 17-18, the overall results were that 27 out of 27 (100%) students rated at least a 4 out of 7 for the ability to function effectively on a team in EET 4940. Meanwhile, in AY 16-17, the overall results were that 23 out of 23 (100%) students rated at least a 4 out of 7 for the ability to function effectively on a team in EET 4940. As compared to AY 16-17, student performance was retained in AY 17-18 at the 100% level. The target was met. In a year-to-year comparison, students maintained the 100% performance level and the target was met in both academic cycles.

On a semester-to semester-basis in AY 17-18, in EET 4940, students were rated at least a 4 out of 7 for the ability to function effectively on a team as follows:

- Fall 2017, 19/19 (100%)
- Spring 2018, 8/8 (100%).

On a semester-to semester-basis in AY 16-17, in EET 4940, students were rated at least a 4 out of 7 for the ability to function effectively on a team as follows:

- Fall 2016, 13/13 (100%)
- Spring 2017, 10/10 (100%).

Similarly, in AY 17-18, the overall results were that 27 out of 27 (100%) students rated at least a 4 out of 7 for the ability to function effectively on a team in IET 4960. Meanwhile, in AY 16-17, the overall results were that 23 out of 23 (100%) students rated at least a 4 out of 7 for the ability to function effectively on a team in IET 4960. As compared to AY 16-17, student performance was retained at 100% level. The target was met. In a year-to-year comparison, students maintained the 100% performance level and the target was met in both academic cycles.

On a semester-to semester-basis in AY 17-18, in IET 4960, students were rated at least a 4 out of 7 for the ability to function effectively on a team as follows:

- Fall 2017, 11/11 (100%)
- Spring 2018, 19/19 (100%).

On a semester-to semester-basis in AY 16-17, in IET 4960, students were rated at least a 4 out of 7 for the ability to function effectively on a team as follows:

- Fall 2016, 9/9 (100%)

- Spring 2017, 13/13 (100%).

For both courses, EET 4940 and IET 4960, the acceptable target was exceeded. The previous performance level (100%) was maintained in the AY 17-18 assessment cycle as well. This result was attributed to proper guidance and support from the course faculty as well as better coordination and teamwork by the presenting students during their final presentation. Additionally, based on the last assessment, instructors assigned a team leader for the first time for every group in these courses.

A team leader's responsibility (in addition to performing as a group member) was to oversee each task assigned to each member of a group and ensure progress as per the project guideline. Further, it was the leader's responsibility to call meetings, review progress, and prepare a revised action plan until the final report and presentation was delivered to the client.

Also, in AY 18-19 "mock" presentations were introduced to give students extra presentation practice. This additional practice helped students to identify their weaknesses, plan, and organize better as a team when they presented their reports to faculty and the clients.   In review, the faculty felt that the mock presentations were very beneficial to student learning and helped maintain the 100% result for this measure.

Additionally, the faculty members value the contributions made by other courses that have helped students throughout the program to be prepared for this course. Students have to take four different English courses, including technical writing and a communications course. It was our assessment that the students' performance in this SLO reflects the combined results of preparation across various courses, and diligent work and support from all faculty involved, the including instructor of the course.

Action - Decision or Recommendation: The target was met with a performance index of 100%. This is a senior design project course where teamwork is emphasized along with the ability to apply the body of knowledge learned in 3½ years of study. It was recommended to continue assigning team leaders, to continue active faculty participation throughout the project duration, and to continue the mock presentations before the final presentation. The responsibilities of the students performing as team leaders will be defined in a written document and monitored to ensure that team leaders are not overloaded with responsibilities or work as compared to their peers.

As the performance index has been at 100% for the past two assessment cycles, the faculty will monitor the results from AY 18-19 and if the pattern of 100% achievement continues, a revision to the grading rubric, changes to the measurement metric, or other changes will be considered to increase the rigor of the measure and/or assignment to drive continuous improvement.

Measure 4.2. (Direct – Knowledge/Ability)

Every semester, students' grades on EET 4940 written proposal are used to assess the attainment of SLO 4. The acceptable target is 80% of students scoring a C or better on the technical portion of the written proposal.

Finding: The target was met.

Analysis: In AY 17-18, the overall results were that 27 out of 27 (100%) students rated C or better on a technical portion of the written proposal in EET 4940. Meanwhile, in AY 16-17, the overall results were that 23 out of 23 (100%) students rated C or better on a technical portion of the written proposal in EET 4940. The target was met. In a year-to-year comparison, students maintained the 100% performance level and the target was met in both academic cycles.

On a semester-to semester-basis in AY 17-18, in EET 4940, students were rated at a C or better on a technical portion of the written proposal as follows:

- Fall 2017, 19/19 (100%)
- Spring 2018, 8/8 (100%).

On a semester-to semester-basis in AY 16-17, in EET 4940, students were rated at least a 4 out of 7 for the ability to function effectively on a team as follows:

- Fall 2016, 13/13 (100%)
- Spring 2017, 10/10 (100%).

Based on the AY 16-17 assessment, in AY 17-18, the instructor decided to review final reports by all IET faculty before the final student submissions of the report for grading. All IET faculty provide feedback on technical content as well as formatting and grammar for each group report. Each group then incorporates recommendations by faculty into their report to make a final report. This additional round of review by faculty has contributed to maintaining the performance index for this SLO. As students have to create the report and after a faculty review, revise the report, the additional time spent editing the document is meant to enhance their educational experience and help them create better written documents.

Action - Decision or Recommendation: The target was met with a performance index of 100%. Results from the assessment were discussed with IET faculty. It was recommended that faculty continue to review the report prior to student submission of the final report. It was also recommended that additional one-on-one (as a group or representatives of a group) review sessions would be offered during office hours. Students should be informed of the review opportunities and highly encouraged to take advantage of them throughout the semester.

SLO 5. **Ability to communicate effectively (ETAC of ABET Outcome e).**

Course Map: Tied to course syllabus objectives
EET 4940: PROJECT DESIGN I
EET 4950 or IET 4960: PROJECT DESIGN II

Measure 5.1. (Indirect – Knowledge/Ability/Skill)

Every semester, upon presentation of capstone projects, ET faculty evaluate student performance with respect to the ability to communicate effectively. The acceptable target is 80% of IET students rating at least a 4 out of 7.

Finding: The target was met.

Analysis: In AY 17-18, the overall results were that 27 out of 27 (100%) students rated at least a 4 out of 7 with respect to the ability to communicate effectively in EET 4940. Meanwhile, in AY 16-17, the overall results were that 23 out of 23 (100%) students rated at least a 4 out of 7 with respect to the ability to communicate effectively in EET 4940. In a year-to-year comparison, students maintained the 100% performance level, and the target was met in both academic cycles.

On a semester-to semester-basis in AY 17-18, in EET 4940, students were rated at least a 4 out of 7 with respect to the ability to communicate effectively as follows:

- Fall 2017, 19/19 (100%)
- Spring 2018, 8/8 (100%).

On a semester-to semester-basis in AY 16-17, in EET 4940, students were rated at least a 4 out of 7 with respect to the ability to communicate effectively as follows:

- Fall 2016, 13/13 (100%)
- Spring 2017, 10/10 (100%).

Similarly, in AY 17-18, the overall results were that 27 out of 27 (100%) students rated at least a 4 out of 7 with respect to the ability to communicate effectively in IET 4960. Meanwhile, in AY 16-17, the overall results were that 23 out of 23 (100%) students rated at least a 4 out of 7 with respect to the ability to communicate effectively in IET 4960. As compared to AY 16-17, student performance was retained at the 100% level. The target was met. In a year-to-year comparison, students maintained the 100% performance level, and the target was met in both academic cycles.

On a semester-to semester-basis in AY 17-18, in IET 4960, students were rated at least a 4 out of 7 with respect to the ability to communicate effectively as follows:

- Fall 2017, 11/11 (100%)
- Spring 2018, 19/19 (100%).

On a semester-to semester-basis in AY 16-17, in IET 4960, students were rated at least a 4 out of 7 with respect to the ability to communicate effectively as follows:

- Fall 2016, 9/9 (100%)
- Spring 2017, 13/13 (100%).

Based on the AY 16-17 assessment results and classroom experience, IET faculty introduced a "tentative budget" for the project in EET 4940, and "revised budget" in IET 4960 report. These additional items were added to bolster clear communication between technical people and people who make financial decisions in an organization. These additions should also help students work better in a multidisciplinary or multi-functional environment, where employees other than engineers are employed. It was agreed by all IET faculty that the quality of reports has increased with the addition of these items in the reports, and the evidence indicates that students are continuing to perform well on this measure.

Action - Decision or Recommendation: The target was met with a performance index of 100%. This is a senior design project course where teamwork is emphasized. The results from the assessment were discussed with IET faculty. It was recommended to continue emphasizing team effort to achieve a common goal in solving engineering problems. It was also decided to continue including an enhanced itemized budget in the project proposal and the final project report. Further attention will be placed on the importance of balancing engineering design with the demands of financial constraints or managerial coworkers. This change will better prepare students for success after they graduate and enhance student learning.

Measure 5.2. (Direct –Skill/Ability)

Every semester, upon presentation of capstone projects (both Project Design I and II), students evaluate each other (i.e., peer evaluation) with respect to the ability to function effectively on a team. The acceptable target is 80% of IET students rating at least a 4 out of 7.

Finding: The target was met.

Analysis: In AY 17-18, the overall results were that 27 out of 27 (100%) students were rated at least a 4 out of 7 by their peers in EET 4940. Meanwhile, in AY 16-17, the overall results were that 23 out of 23 (100%) students were rated at least a 4 out of 7 by their peers in EET 4940. In a year-to-year comparison, students maintained the 100% performance level and the target was met in both academic cycles.

On a semester-to semester-basis in AY 17-18, in EET 4940, students were rated at least a 4 out of 7 by their peers as follows:

- Fall 2017, 19/19 (100%)

- Spring 2018, 8/8 (100%).

On a semester-to semester-basis in AY 16-17, in EET 4940, students were rated at least a 4 out of 7 by their peers as follows:

- Fall 2016, 13/13 (100%)
- Spring 2017, 10/10 (100%).

Similarly, in AY 17-18, the overall results were that 27 out of 27 (100%) students rated at least a 4 out of 7 by their peers in IET 4960. Meanwhile, in AY 16-17, the overall results were that 23 out of 23 (100%) students rated at least a 4 out of 7 by their peers in IET 4960. As compared to AY 16-17, student performance was retained at 100% level. The target was met. In a year-to-year comparison, students maintained the 100% performance level and the target was met in both academic cycles.

On a semester-to semester-basis in AY 17-18, in IET 4960, students were rated at least a 4 out of 7 by their peers as follows:

- Fall 2017, 11/11 (100%)
- Spring 2018, 19/19 (100%).

On a semester-to semester-basis in AY 16-17, in IET 4960, students were rated at least a 4 out of 7 by their peers as follows:

- Fall 2016, 9/9 (100%)
- Spring 2017, 13/13 (100%).

Based on the AY 16-17 assessment, the instructor assigned a team leader for the first time for every group in these courses. The team leader's responsibility (in addition to functioning as a group member) was to oversee each task assigned to each member in a group and ensure that the project was progressing as per the project guideline. Further, the team leader's responsibilities included calling meetings, reviewing progress and preparing revised action plans until the final report and presentation were delivered to the client. This change helped the student groups function more smoothly and lead to continued evidence of student learning in the assessment results.

Action - Decision or Recommendation: The target was met with a performance index of 100%. This is a senior design project course where teamwork is emphasized. Results from the assessment were discussed with IET faculty. It was recommended to continue emphasizing team effort to achieve a common goal in solving engineering problems. Team leaders will be implanted in AY 18-19 as well, and special attention will be made to ensure that students performing team leader duties are not overloaded with work as compared to their peers. A written document outlining group leader responsibilities will be created. While the addition of team leaders has been successful, another year of data and experience with this practice will help find ways that the team leader role may be improved for the enhancement of the student learning process for all students.

SLO 6. **Ability to perform self-directed professional development (ETAC of ABET Outcome f).**

Course Map: Tied to course syllabus objectives.

IET 3150: FLUID POWER
IET 4720: QUALITY CONTROL
EET 4950 or IET 4960: PROJECT DESIGN II

Measure 6.1. (Direct – Knowledge/Skills)

Every spring semester, students' grades on the IET 4720 Test 2 are used to assess the attainment of SLO 6. The acceptable target is 80% of students scoring a C or better on Test 2.

Finding: The target was not met.

Analysis: In AY 16-17, 14 out of 26 (53.85%) students scored a C or better on Test 2 in IET 4720. Meanwhile, in AY 17-18, 25 out of 35 (71.4%) students scored a C or better in Test 2 in IET 4720. In a year-to-year comparison, in the target was not met in either AY 16-17 or AY 17-18. However, in AY 17-18, the target was missed by 8.6% compared to 24.15% in AY 16-17. Therefore, in AY 17-18, while still 8.6% short of the target, student performance did increase by 17.55% over the prior assessment cycle. Thus, the evidence indicates that student learning did improve over AY 17-18, and the results were much closer to the target.

Based on the results from the last assessment (AY 16-17) assessment, additional quizzes for the materials covered in Test 2 were made available to students. It is also noted that this may have contributed an increase of about 18% in the performance index in the current assessment. However, despite the large year-to-year improvement, there is a clear need for more action in this area.

Action - Decision or Recommendation: The target was not met with a performance index of 71.4%. Results from the assessment were discussed with IET faculty. It was recommended to incorporate an additional practice opportunity (such as an assignment or quiz) prior to Test 2 to enable students to perform self-directed professional and educational development. Further, the instructor of the course recommended several changes. Adding few more worked-out examples in the class should help students understand the solution procedure for problems covered in the material for Test 2. Additionally, the concepts for the materials covered in Test 2 must be taught in a more repetitive manner and at slower pace and greater in depth. These changes will be implemented into the course.

Measure 6.2. (Direct – Knowledge/Skills)

Every fall semester, students' grades on the IET 3150 Tests 2 and 3 are used to assess the attainment of SLO 6. The acceptable target is 80% of students scoring a C or better on Tests 2 and 3.

Finding: The target was met.

Analysis: In AY 17-18, 50 out of 58 (89.3%) students scored C or better in Test 2 and Test 3. Meanwhile, in AY 16-17, 46 out of 50 (92%) students scored C or better in Test 2 and Test 3. In a year-to-year comparison, though students' performance met the target. However, the performance index decreased by 2.7% compared to AY 16-17.

On a semester-to semester-basis in AY 17-18, in IET 43150, students were rated at a C or better on Test 2 and Test 3 to assess the attainment of SLO 6 as follows:

- Test 2, 23/28 (82%)
- Test 3, 27/28 (96%).

On a semester-to semester-basis in AY 16-17, in IET 4960, students were rated at a C or better on Test 2 and Test 3 to assess the attainment of SLO 6 as follows:

- Test 2, 22/25 (88%)
- Test 3, 24/25 (96%).

The instructor of the course pointed out that based on the assessment of AY 16-17, the rigor of the test was slightly increased for AY 17-18. The increased difficulty along with random fluctuation in performance may be year-to-year variation combined with random event.

Action - Decision or Recommendation: The target was met with a performance index of 89.3%. Results from the assessment were discussed with IET faculty. It was recommended not to change the rigor of the test questions until data are available for the next assessment cycle. If the trend shows unfavorable (downward) results, then further plan of actions will be discussed among IET faculty.

Measure 6.3. (Indirect – Knowledge/Ability/Skill)

Every semester, upon presentation of capstone projects, ET faculty evaluate student performance with respect to the ability to perform self-directed professional development. The acceptable target is 80% of IET students rating at least a 4 out of 7.

Finding: The target was met.

Analysis: In AY 17-18, the overall results were that 27 out of 27 (100%) students were rated at least a 4 or better by faculty on student performance evaluations with respect to

the ability to perform self-directed professional development in IET 4960. Meanwhile, in AY 16-17, the overall results were that 23 out of 23 (100%) students were rated at least a 4 or better by faculty on student performance evaluations with respect to the ability to perform self-directed professional development in IET 4960. As compared to AY 16-17, student performance was retained at 100% level. The target was met. In a year-to-year comparison, students maintained the 100% performance level, and the target was met in both academic cycles. The target was met both years, and the results were stable.

On a semester-to semester-basis in AY 17-18, in IET 4960, students were rated a 4 or better by faculty on student performance evaluations with respect to the ability to perform self-directed professional development in IET 4960 as follows:

- Fall 2017, 11/11 (100%)
- Spring 2018, 19/19 (100%).

On a semester-to semester-basis in AY 16-17, in IET 4960, students were rated a 4 or better by faculty on student performance evaluations with respect to the ability to perform self-directed professional development in IET 4960 as follows:

- Fall 2016, 9/9 (100%)
- Spring 2017, 13/13 (100%).

Based on the assessment from AY 16-17, the instructor of the course introduced mandatory meeting agendas in AY 17-18 whenever student groups met among themselves. Team leaders were assigned to each group for the first time. Meeting minutes were made mandatory for student group meetings. This allowed students to prioritize their tasks and guide themselves to achieve a few goals at a time towards solving the main goal (objective) of the project in their own pace, motivation, and direction. Initiating practices designed to foster better group communication and functioning helped enhance the student experience in the course and played a role in keeping results stable at 100% from year-to-year.

Action - Decision or Recommendation: The target was met and results were discussed with the faculty teaching this course. This is a senior design project course where teamwork is emphasized. It was recommended to continue emphasizing team effort to achieve a common goal in solving engineering problems by assigning requiring team leaders, meeting agenda, and meeting minutes. Efforts will be made to ensure that team leaders are not unfairly overburdened with responsibilities as compared to their peers, and the faculty will research other methods of enhancing the group learning experience.

SLO 7. A commitment to address ethical considerations involved in solving industrial engineering technology problems (ETAC of ABET Outcome g).

Course Map: Tied to course syllabus objectives.

EET 1321: ELECTRICAL PRONCIPLES II LAB
ENGL 3510: MOTION AND TIME STUDY
EET 4940: PROJECT DESIGN I

Measure 7.1. (Direct –Skill)

Every semester, student's laboratory reports in EET 1321 are evaluated. The acceptable target is 80% of IET students graded at a C or better on laboratory reports.

Finding: The target was met.

Analysis: 27 out of 32 (84%) of the students graded C or better in course EET 1321 in Spring 2018. The target was met. This is a changed criterion for assessment implemented in Fall 2017. Therefore, there is no directly comparable data from AY 16-17.

This assessment item was an addition found in the AY 16-17 assessment plan and was implemented in the AY 17-18. Based on the changed criterion, a standardized format for lab reports was developed. Students were encouraged to follow the format of the report for lab report for all the labs during the semester. Students are instructed not to plagiarize in any form. Intellectual thievery is explained in every lab-class and students are warned of severe punishment if the policy of ethics in not followed in report writing.

The previous course map for this assessment in AY 16-17 involved students' course grades from COMM 1010. This data was collected at the university level. However, as engineering faculty have no control over this course, the assessment of measure 7.1 was moved to EET 1321. This change gives the engineering faculty enhanced control over the assessment process and makes sure that students are getting experience and learning communications skills specific to their major.

Action - Decision or Recommendation: The target was met and the results were discussed with IET faculty. Since this was the first time the current course was selected to assess this measure, it was decided to wait until the next assessment cycle before making any major changes. A more robust data set will better enable faculty to identify course enhancements. In the meantime, the faculty recommended the creation of a well-written sample report for students to use an example.

Measure 7.2. (Direct –Skill)

Every fall semester, students' final reports on their semester projects will be assessed in IET 3510. The acceptable target is 80% of graduating IET students graded at a C or better on the semester report in IET 3510.

Finding: The target was met.

Analysis: In AY 17-18, 30 out of 33 (90%) scored C or better in Fall 2017. The target was met, and results from AY 16-17 are not directly comparable.

This is a changed criterion for assessment implemented in Fall 2017. In AY 2016-2017, this measure was evaluated using student course grades in ENGL 3230. After reviewing out AY 16-17 assessment process, the faculty decided that moving this measure back to the engineering department would give faculty more control over student learning, the assessment process, and ensure that the evidence of student learning reflected results better associated with their degree field than results from a course outside of the engineering department.

Based on the instructor's review of the AY 16-17 assessment and recollection of the semester projects, a standardized format for the report was introduced in AY 17-18. Throughout the semester, students were encouraged to follow the format of the standardized report, including citations and bibliography. Students were instructed not to plagiarize in any form. Intellectual thievery is explained during the course and students are warned of severe punishment if the ethics policy is not followed in report writing.

In addition, one group did not perform well because they were a group of international students and were heavily involved in a music program, the Christmas Gala, and they did not do their project to the level of expectation. Next year, group formation will be closely monitored to avoid similar situations, where all students are heavily involved in the same extracurricular activity, particularly the Christmas Gala.

Action - Decision or Recommendation: The target was met with a performance index of 90%. The results from the assessment were discussed with IET faculty. It was recommended that instructor supervise group formation for the semester project so that each group can fulfill their project obligation in time. The instructor will give increased attention to ensuring that each group has a diverse student population in hopes that this will decrease the problems associated with all group members sharing a single extracurricular activity.

Measure 7.3. (Direct – Knowledge/Ability/Skill)

Every semester, upon presentation of capstone projects, ET faculty evaluate student performance on an oral presentation and written proposal (report). The acceptable target is 80% of students scoring a C or better on the oral presentation and written proposal.

Finding: The target was met.

Analysis: In AY 17-18, the overall results were that 27 out of 27 (100%) students scored a C or better on the oral presentation and written proposal in EET 4940. Meanwhile, in AY 16-17, the overall results were that 23 out of 23 (100%) scored C or better on oral presentation and written proposal in EET 4940. As compared to AY 16-17, student performance was retained at 100% level. The target was met. In a year-to-year comparison, students maintained the 100% performance level, and the target was met in both academic cycles.

On a semester-to semester-basis in AY 17-18, in EET 4940, students were rated at least a 4 out of 7 for the ability to function effectively on a team as follows:

- Fall 2017, 19/19 (100%)
- Spring 2018, 8/8 (100%).

On a semester-to semester-basis in AY 16-17, in EET 4940, students were rated at least a 4 out of 7 for the ability to function effectively on a team as follows:

- Fall 2016, 13/13 (100%)
- Spring 2017, 10/10 (100%).

Based on AY 16-17 assessment, in AY 17-18, the instructor decided to review final reports by all IET faculty before the final submission of the report for grading. All IET faculty provide feedback on technical content as well as formatting and grammar for each group report. Each group then incorporates recommendations by the faculty into their report to make a final report. This additional round of review by faculty has contributed to maintaining the performance index for this SLO.

In AY 17-18, the instructor also introduced "mock" presentations for the students, which they have do several times before the final presentation. These mock presentations have better prepared students for the final report by giving them more practice in speaking about their projects in front of faculty or other students.

For capstone projects, student groups/teams must give a final presentation before the ET faculty and answer follow-up questions and answers at the end of the presentation. This presentation and project is a team effort. Well-structured and thought-out preparation and presentations can be attributed to a group's ability to function as a team. The introduction of mock presentations with the instructor were very helpful in achieving this target. Overall, the evidence of student learning in AY 17-18 was satisfactory and met the target.

Action - Decision or Recommendation: The target was met with a performance index of 100%. This is a senior design project course where teamwork is emphasized along with the ability to apply the body of knowledge learned in 3½ years of study. It was recommended to continue the mock presentations several times before the actual

presentation and feedback from the faculty on written report before final submission. The faculty will look for ways to make the mock presentations even more effective. The faculty will develop a best practices sheet for students to review before presentations.

Comprehensive summary of key evidence of improvements based on analysis of results

SLO 1. Ability to apply the industrial engineering technology knowledge, skills, and tools to real-world problem solving (ETAC of ABET Outcome a).

- The instructor decided to introduce G-code programming in IET 2020 in greater depth during AY 17-18. This would introduce greater challenge and enhance learning in the course. Therefore, on the final exam, one major test question asked students to write machine programming in G-code. However, some students struggled with this item and the assessment results were slightly lower than last year.

- The instructor introduced "mock" presentations in capstone projects for the students, which they have do several times before the final presentation. This additional presentation practice is meant to help them perform better during the final presentation. While the year-to-year results were consistent, the faculty felt that the practice was helpful to the students.

SLO 2. Ability to perform tests, measurements and experiments (ETAC of ABET Outcome b).

- The instructor of the IET 3570 introduced more problems in the class. These problems were targeted to address student deficiencies that were discovered in the AY 16-17 assessment. Besides holding a comprehensive exam review session before the final, students were encouraged to utilize faculty office hours for one-on-one tutorial sessions. These changes were introduced to enhance student learning as well as a better student experience through one-one-one interaction with faculty members.

- To enhance students' skills in problem solving, it was recommended to introduce Microsoft Excel and Macros in the future classes. Based on discussion with the faculty teaching this course, it was agreed that using Microsoft Excel for financial problem solving would be a good tool to introduce in this course, IET 3570 Engineering Economics.

- A comprehensive exam review for IET 4700 was done before the final. This activity has shown a positive impact on the performance index.

- To enhance students' skills in problem solving in IET 3570, it was recommended to introduce Microsoft Excel and Macros in the future classes.

- It was recommended to continue the practice of providing a comprehensive review before final exam for IET 4700. Review sessions will allow students to focus on important topics and will guide their study.

- Students were made to be aware of their responsibility to be punctual. Further, it was recommended that group formation for the experiments will be supervised by the instructor to avoid "students only" initiated group formation. Group formation with diverse skills will enhance project quality in IET 4700

SLO 3. Ability to conduct continuous improvement projects (ETAC of ABET Outcome c).

- The instructor of the IET 3150 introduced relatively difficult problems for the experiment to increase course rigor and enhance student learning. The increase in difficulty presents a likely cause for the declining year-to-year results. However, the decline could be caused by the combined effect of the difficult problems as well as the way student group-formation was carried out.

- It was recommended that the faculty should supervise student group-formation in IET 3150 to prohibit too many latecomers and absentees being assigned to one or two groups. The faculty also recommended covering difficult problems with several examples so that the students will have sufficient experience and knowledge to solve similar problems on the tests.

- The faculty of the IET 3510 assigned students' semester projects in a timelier manner. Finding the adequate number of semester projects in timely manner is difficult as it requires participation from clients (industrial partners outside of the university). Therefore, the faculty made an effort to find industrial partner clients earlier in the academic year than in prior years. This gave the students more time to ruminate on the projects and gain more experience working with real-world clients.

- The instructor of IET 3510 decided not to accept all student-initiated groups. The instructor decided to intervene during group formation to ensure that groups can manage their project responsibilities and to check for a potential reoccurrence of the "Christmas Gala" timing conflict as participation in the gala may not be limited to music majors. The faculty also decided to form student groups with diversity (local, national and international students) and different educational workloads so that each group will manage their team responsibility and could deliver the expectations of the project on time.

- It was recommended that the instructor for IET 3510 explain expectations and responsibilities for the semester project to the students early in the semester. The instructor also recommended discussing future events with students, such

as the Christmas Gala, sporting events, etc., and suggest that those involved in these events to begin their projects as early as possible. Finally, it was also recommended that the instructor should intervene during group formation so that groups can better manage their responsibility of the project's deliverables.

SLO 4. Ability to function effectively on a team (ETAC of ABET Outcome d).

- The instructor of the IET 4960 course introduced mandatory meeting agendas whenever student groups met among themselves. Team leaders were assigned to each group for the first time. Meeting minutes were made mandatory for student group meetings. This allowed students to prioritize their tasks and guide themselves to achieve a few goals. The intent was for students to move deliberately towards solving the main goal (objective) of the project at their own pace, motivation, and direction.

- For capstone projects, the final presentation by a team was made before ET faculty followed by questions and answers at the end of the presentation. This project is a team effort. Well-structured and thought-out preparation and presentations can be attributed to a group's ability to function as a team. The introduction of meeting agendas and mock presentations with the instructor was found to be essential in achieving this target.

- It was recommended to continue emphasizing team work in capstone projects to achieve a common goal in solving engineering problems. It was also recommended to continue team meetings with an agenda and minutes lead by a leader for future semesters as well.   The responsibilities of the students performing as team leaders will be defined in a written document and monitored to ensure that team leaders are not overloaded with responsibilities or work as compared to their peers.

- The instructor reviewed the final capstone projects by all IET faculty before the final submission of the report for grading. All IET faculty provide feedback on group reports. These reports include feedback on technical content as well as formatting and grammar. Each group then incorporates recommendations by faculty into their report to make a final report. This additional round of review by faculty has contributed to maintaining the performance index for this SLO.

- The instructor introduced 'mock' presentations in capstone projects for the students, which they have do several times before the final presentation. This additional presentation practice is meant to help them perform better during the final presentation. While the year-to-year results were consistent, the faculty felt that the practice was helpful to the students.

- The final presentation in capstone projects by a team before ET faculty followed by questions and answers at the end of the presentation is considered a team

effort. A well-structured and thought-out preparation and presentation can be attributed to group's ability to function as a team. The introduction of mock presentations with the instructor was helpful in achieving this target.

SLO 5. Ability to communicate effectively (ETAC of ABET Outcome e).

- In capstone projects, it was recommended to continue emphasizing team effort to achieve a common goal in solving engineering problems. As the target has been consistently met for several years, the faculty will review this measure to see if it needs to be revised to drive improvement.

- IET faculty introduced a "tentative budget" for the project in EET 4940, and "revised budget" in IET 4960 report. This additional item in each course is meant to bolster clear communication between technical people and people who make financial decisions in an organization. These additions should also help students work better in a multidisciplinary or multi-functional environment, where employees other than engineers are employed. It was agreed by all IET faculty that the quality of report has increased with the addition of this item in the report and the evidence indicates that students are continuing to perform well on this measure.

- It was recommended to continue emphasizing team effort to achieve a common goal in solving engineering problems. It was also decided to continue including an enhanced itemized budget in the project proposal and the final project report. Further attention will be placed on the importance of balancing engineering design with the demands of financial constraints or managerial coworkers. This will better prepare students for success after they graduate.

- The instructor updated the EET 4940 course in AY 17-18 and assigned a team leader for the first time in every group in these courses. The team leader's responsibility (in addition to functioning as a group member) is to oversee each task assigned to each member in a group is progressing as per the project guideline. Further, the leader's responsibilities include calling meetings, reviewing progress, and preparing revised action plans until the final report and presentation is delivered to the client. These changes were made to enhance student learning and functioning in a group environment. These changes also likely played a role in the continuous attainment of assessment targets. As mentioned in other sections of this report, the responsibilities of the students performing as team leaders will be defined in a written document and monitored to ensure that team leaders are not overloaded with responsibilities or work as compared to their peers.

- It was recommended in EET 4940 to continue emphasizing team effort to achieve a common goal in solving engineering problems by assigning requiring team leaders, meeting agenda, and meeting minutes. Other measures to

encourage efficient and prosperous group work will also be researched and introduced by the faculty.

SLO 6. Ability to perform self-directed professional development (ETAC of ABET Outcome f).

- Additional quizzes for the materials covered in Test 2 were made available to students in IET 4720. It is also noted that this may have contributed an increase of about 18% in the performance index in the current assessment. However, there is a need for more action needed in this area. The instructor of the course suggested adding a few more worked-out examples in the class to help students understand the solution procedure for problems covered in the material for Test 2. Additionally, it was also suggested that students learning of the concepts for the materials covered in Test 2 must be taught in a more repetitive manner.

- It was recommended to incorporate an additional practice opportunity (such as an assignment or quiz) prior to Test 2 to enable students to perform self-directed professional development. Further, the instructor of the course recommended that the concepts for the materials covered in Test 2 should be taught at slower pace and greater in depth. These changes will be implemented into the course.

- The instructor of the course also pointed out that the rigor of the test in IET 3150 was slightly increased for AY 17-18. It was recommended not to change the rigor of the test questions until data are available for the next assessment cycle. If the trend shows unfavorable (downward) results, then further plans of action will be discussed among IET faculty.

- The instructor of the IET 4960 course introduced mandatory meeting agendas whenever student groups met among themselves. Team leaders were assigned to each group for the first time. Meeting minutes were made mandatory for student group meeting. This allowed students to prioritize their tasks and guide themselves to achieve a few goals. The intent was for students to move deliberately towards solving the main goal (objective) of the project at their own pace, motivation, and direction.

- It was recommended in IET 4960 to continue emphasizing team effort to achieve a common goal in solving engineering problems by assigning requiring team leaders, meeting agenda, and meeting minutes.

SLO 7. A commitment to address ethical considerations involved in solving industrial engineering technology problems (ETAC of ABET Outcome g).

- A new course, EET 1321, was used to assess ethical considerations involved in solving industrial engineering technology problems skills instead of materials

from an old course. The old course (COMM 1010) was offered by the university in a different department and was a holistic assessment of the course merely looking at the final grade of the student. Upon reflection, this was not thought appropriate for the assessment. Therefore, in AY 17-18, faculty decided to change course for the assessment of this SLO to EET 1321 laboratory report, which is more specific to our degree program communication needs. Students in EET 1321 were encouraged to follow the standardized format of the lab report for all the labs during the semester. Students are instructed not to plagiarize in any form. Intellectual thievery is explained in every lab-class and students are warned of severe punishment if the policy of ethics in not followed in report writing.

- The criterion to assess SLO7" Commitment to address ethical consideration involved in solving industrial engineering technology problems" has been changed and implemented. In AY 2016-2017, this measure was evaluated using student course grades in ENGL 3230. After reviewing our AY 16-17 assessment process, the faculty decided that moving this measure back to the engineering department (IET 3510) would give faculty more control over student learning, the assessment process, and ensure that the evidence of student learning reflected results better associated with their degree field than results from a course outside of the engineering department.

- Based on the instructor's review of the AY 16-17 assessment and recollection of the semester projects, a standardized format for the lab report was introduced in AY 17-18. Throughout the semester, students were encouraged to follow the format of the standardized report, including citations and bibliography. Students were instructed not to plagiarize in any form. Intellectual thievery is explained during the course and students are warned of severe punishment if the policy of ethics in not followed in report writing.

- It was recommended that instructor to supervise group formation in IET 3510 for the semester project so that each group can fulfill their project obligation in time.

- In capstone projects, the instructor and IET faculty reviewed the final reports before the final submission of the report for grading. All IET faculty provide feedback on technical content as well as formatting and grammar for each group's report. Each group then incorporated recommendations by faculty into their report to make a final report.   This additional round of review by faculty has contributed to maintaining the performance index for this SLO.

- The instructor introduced "mock" presentations for the students, which they must do several times before the final presentation. The introduction of mock-up presentations with the instructor were helpful in achieving this target.

Plan of action moving forward

Assessment data for academic year 2017-2018 show that targets were almost all met or exceeded. The Department of Engineering Technology is encouraged by the improvements made by faculty during the AY 17-18 and recognize it is necessary to strive for continuous improvement needed every year to achieve model student learning outcomes. The following paragraphs summarize the changes for next cycle based on an analysis of this year's assessment results

In all classes faculty will emphasize the importance of being punctual and aware of their responsibilities. Comprehensive review sessions will be provided to students in order to allow them focus on important topics and guide their study before the final exam for courses such as IET 4700.

In classes, which require hands-on experiences such as IET 2020, class size will be limited to 25 students per session. In addition, More G-code programming examples will be introduced in IET 2020 to the student to improve their programming skills

For courses which require rigorous calculations such as IET 3570, IET 3150, and IET 4720, the instructor will explain expectations and responsibilities for students in the beginning of every semester. The faculty will introduce Microsoft Excel and Macros in the future classes (IET 3570) and cover difficult problems with several examples so that the students will have sufficient experience and knowledge to solve similar problems on the tests (IET 3150). In IET 4720, faculty will incorporate an additional practice opportunities (such as an assignment or quiz) prior to Test 2 to enable students to perform self-directed professional development. Further, the instructor of the course will cover the concepts for the materials in Test 2, but teach them at slower pace and with greater in depth. Students will also be encouraged to utilize faculty office hours for one-on-one tutorial sessions for IET 3570.

For courses which assess communication skills such as EET 1321, the instructor will make a sample of well-written report available for students as an example. Also, the faculty decided to continue using standardized lab formats for EET 1321 and assess this course and students' performance so that at the end of the next assessment cycle, faculty could review the progress and make any necessary action plan to consistently achieve the target.

In courses, which require students working in teams such as IET 4700, IET 3150, EET 4940, EET 4950 and IET 4960 the instructor will supervise group formation for the project so that each group can more easily fulfill their project obligation on time. Diversity in group formation will be emphasized since different students' skills will complement each other and will enhance the quality of projects. Additionally, group formation will be closely monitored to avoid similar situations, where all students are heavily involved in the same extracurricular activity, particularly the Christmas Gala. Students who may be involved in extracurricular activities will be encouraged to begin their projects as early as possible.

For senior design projects which include EET 4940, EET 4950, or IET 4960, the instructor will be emphasizing team effort to achieve a common goal in solving engineering problems by requiring team leaders, meeting agendas, and meeting minutes. Students will continue "mock" presentations several times before the actual presentation in order to enhance their presentation skills. Instructors will continue practices shown to improve student learning such as assigning team leaders, providing an enhanced itemized budget in the project proposal and the final project report, and administering "mock" presentations before the final presentation for the EET 4940. The faculty will look for ways to make the mock presentations even more effective. For instance, the faculty will develop a "best practices" sheet for students to review before presentations. Further attention will be placed on the importance of balancing engineering design with the demands of financial constraints or managerial coworkers. This will better prepare students for success after they graduate. Team leaders will be implanted in AY 18-19 as well, and special attention will be made to ensure that students performing team leader duties are not overloaded with work as compared to their peers. While the addition of team leaders has been successful, another year of data and experience with this practice will help find ways that the team leader role may be improved for the enhancement of the student learning process for all students. The responsibilities of the team leader will also be written out to provide students with clarity.

Performance indices which were at the 100% level will be closely monitored. A possible change in the performance targets will be discussed in the faculty meeting and Industrial Advisory Committee meeting in Fall 2018 and decisions will be made based on the committee's recommendation for each of the performance targets.

In conclusion, ET faculty has reflected on the assessment results from AY 17-18 as well as previous years and identified some explicit changes to improve student learning. Continued commitment and attention to assessment and evidence of student learning will improve the quality of education offered through the IET program. Data will be continually analyzed to ensure continuous improvement moving forward.