Industrial Distribution, BS

Program Description

The mission of the Bachelor of Science in Industrial Distribution program at Texas A&M University is to:

- Prepare graduates for sales engineering, sales management, supply chain operations and logistics management mid-management positions with wholesale distributors, who purchase, warehouse, sell, distribute and service a wide variety of products, and with manufacturers who sell through distributors.
- Conduct applied research and develop new best practices in industrial distribution, logistics, and supply chain management that mutually benefits the university and its industrial, governmental, and academic collaborators
- Provide service and leadership in the promotion and advancement of the department, the university and the industrial distribution profession

Outcomes

Ability to design solutions for technical problems: Industrial Distribution graduates will be able to design solutions for well-defined technical problems and assist with the engineering design of systems, components, or processes appropriate to the industrial distribution field/industry. Examples: designing a new solution for managing technical salesforce, inventory planning and replenishment strategies, transportation strategies, warehouse management, supply base optimization, new product introductions, etc. (ABET ETAC SO #2).

Depth of Knowledge: Industrial Distribution graduates will be able to apply knowledge, techniques, skills and modern tools of mathematics, science, engineering, and technology to solve well-defined engineering problems appropriate to Industrial Distribution (ABET ETAC SO #1).

Communication: Industrial Distribution graduates will be able to an apply written, oral, and graphical communication in well-defined technical and non-technical environments; and identify and use appropriate technical literature (ABET ETAC SO #3).

Conduct tests and measurement and analysis: Industrial Distribution graduates will be able to demonstrate an ability to conduct standard tests and measurements, and to conduct, analyze, and interpret experiments (ABET ETAC SO#4).

Ability to function in a team: Industrial Distribution graduates will be able to demonstrate an ability to function effectively as a member of a technical team (ABET ETAC SO #5).

Integration of Systems: Industrial Distribution Students will be able to accomplish the integration of systems using appropriate analytical, computational, and application practices and procedures (ABET #6).

Probability & statistics and economic analysis: Industrial Distribution graduates will be able to apply knowledge of probability, statistics, engineering economic analysis and cost control, and other technical sciences and specialties necessary in the field of industrial engineering technology (ABET #7).

Measure 1 – Student Work

Data Collection: This method provides a direct measure of student outcomes. Every fall and spring semester, the course instructors assess student outcomes through various student works, such as homework assignments, quizzes, specific questions on exams, projects (in the form of written reports and presentations), case studies, and peer evaluations. The type of student work (or metric) assessed depends on the nature of the student outcome and may vary from course to course. Each outcome is assessed through multiple courses consisting of multiple metrics. See relevant documentation under *Supporting Documentation*.

Below is an example of how data is collected at each individual course level for each metric.

Assessment metrics scoring rubric: To calculate the equivalent metric score, the following scoring rule was used - "If 75% or more of students have a score of – (**Threshold value**) then the metric score is (**Assigned Score**)"

Threshold Value	Assigned Score	Description
0%	**0**	Null
25%	**1**	Poor Level
50%	**2**	Low Level
65%	**3**	Next Level
75%	**4**	Highest Level

This is for non-lab-based courses. For lab-based courses such as MMET 401, following rubrics is used:

Assessment metrics scoring rubric: "If 75% or more of students have a score – (**Threshold value**) then the Metric Score is (**Assigned Score**)"

Threshold Value	Assigned Score	Description
0%	**0**	Null
25%	**1**	Poor Level
50%	**2**	Low Level
60%	**3**	Next Level
70%	**4**	Highest Level

Methodology or data analysis strategy: The course instructor collects the data, compiles across the relevant metrics for each outcome that are covered by his/her course and send the findings to the ID assessment coordinator at the end of each semester. The ID assessment coordinator compiles/aggregates the findings at the program level. The program level score for each outcome is then compared against the target score, which is 3.0 or more out of 4.0. These results are then presented and discussed at an ID faculty meeting to identify the relevant course(s) to make the necessary curriculum change to improve the outcome in question.

Target 1

This outcome is considered adequately attained if the program level score for this outcome is 3.0 or more out of 4.0.

Finding 1: Met

Ability to design solutions for technical problems: The program level aggregation for this outcome was 3.70/4.0 for Fall 2021 and 3.65/4.0 for Spring 2022. In other words, both semester data show that the program level aggregated scores for this outcome were greater than the target score (3 out of 4). Thus, this outcome was adequately met.

Depth of Knowledge: The program level aggregation for this outcome was 3.66/4.0 for Fall 2021 and 3.66/4.0 for Spring 2022. This was MET.

Communication: The program level aggregation for this outcome was 3.87/4.0 for Fall 2021 and 3.90/4.0 for Spring 2022. This was MET.

Conduct tests and measurement and analysis: The program level aggregation for this outcome was 3.83/4.0 for Fall 2021 and 3.84 for Spring 2022. This was MET.

Ability to function in a team: The program level aggregation for this outcome was 3.94/4.0 for Fall 2021 and 3.97/4.0 for Spring 2022. This was MET.

Integration of Systems: The program level aggregation for this outcome was 3.68/4.0 for Fall 2021 and 3.72/4.0 for Spring 2022. This was MET.

Probability & statistics and economic analysis: The program level aggregation for this outcome was 3.46/4.0 for Fall 2020 and 3.50/4.0 for Spring 2021. This outcome was MET.

Measure 2 – Graduating Senior Surveys

Data Collection: This is an indirect measure. Toward the end of every fall and spring semester, a comprehensive survey is sent out to all graduating ID seniors for them to fill out. The survey asks the graduating seniors about 85 questions that cover a wide range of topics, including how well the ID courses prepared them to achieve various outcomes, their graduation time, internship experience, job offer status, faculty interactions, advising relevancy, lab experience, and, of course, their self-assessment with respect to ABET Criterion 3, student outcomes. The typical response rate for this survey is nearly 70%, which is considered very high and provides reliable assessment data. However, since it is a self-assessment, this method is considered an indirect measure. See the survey items under *Supporting Documentation*.

Scoring rubric: Students self-assess as to how well they feel the IDIS courses have prepared them with respect to the abovementioned outcomes on a scale of 1-5, where 5 = Extremely well prepared, 4 = Well prepared, 3 = Acceptably prepared, 2 = Needs Improvement, and 1 = Needs considerable improvement.

Methodology or data analysis strategy: The survey ratings are tabulated to determine the percentage of students who rated 4 or more out of 5. The analysis is done at an outcome level meaning that each outcome data is analyzed separately to determine any gap in an outcome. This percentage is then compared to the target %, which is 70% of the students would rate 4 or more out of 5.0 for any given outcome. These results are then presented and discussed at an ID faculty meeting to identify the relevant course(s) to make the necessary curriculum change to improve the outcome in question.

Target 2

This outcome is considered adequately attained if the 70% of the student's rate 4 or more out of 5.0 in a survey question related to this outcome.

Finding 2: Met

Ability to design solutions for technical problems: The Fall 2021 Senior Exit Survey shows that 89% of the students scored this outcome (i.e., design systems, components, or process) at a 4 or 5 rating and that for Spring 2022 showed 92% of the students scored this outcome at a 4 or 5 rating.

Depth of Knowledge: Graduating senior survey data for Fall 2021 shows that 88% (N=137) of the students rated 4 or higher with respect to a question related to this outcome regarding knowledge skills. Spring 2022 senior survey data for the same shows that 90% (N=168) of the students rated 4 or more saying that the program has well prepared them for this outcome. This outcome has been MET.

Communication: Graduating senior survey data for Fall 2021 shows that 95% (N=137) of the students rated 4 or higher with respect to a question related to a communication skill. Likewise, the graduating senior survey data for Spring 2022 shows that 97% (N=168) of the students rated 4 or higher with respect to a question related to a communication skill.

Conduct tests and measurement and analysis: Graduating senior survey data for Fall 2021 shows that 88% (N=137) of the students rated 4 or higher with respect to a question related to a communication skill. Spring 2022 senior survey data for the same shows that 92% (N=168) of the students rated 4 or more saying that the program has well prepared them for this outcome.

Ability to function in a team: Graduating senior survey data for Fall 2021 shows that 97% (N=137) of the students rated 4 or higher with respect to a question related to a teamwork skill. Spring 2022 senior survey data for the same shows that 98% (N=168) of the students rated 4 or more saying that the program has well prepared them for this outcome. This outcome is MET.

Integration of systems: Graduating senior survey data for Fall 2021 shows that 89% (N=137) of the students rated 4 or higher with respect to a question related to an integration of systems skills. Spring 2022 senior survey data for the same shows that 93% (N=168) of the students rated 4 or more saying that the program has well prepared them for this outcome. This outcome has been adequately met.

Probability & statistics and economic analysis: Graduating senior survey data for Fall 2021 shows that 93% (N=137) of the students rated 4 or higher with respect to a question related to a probability and statistics skills. Spring 2022 senior survey data for the same shows that 90% (N=168) of the students rated 4 or more saying that the program has well prepared them for this outcome. This outcome has been adequately met.

Measure 3 – Capstone Project Assessment by Industry Advisory Committee Members

Data Collection: This provides a direct measure to this student outcome. At the end of each Fall and Spring Semester, the ID undergraduate industry advisory committee (UIAC) members will attend the student presentation. Based on that presentation, the UIAC member assess the student's ability to various ABET student outcomes including this one. The industry members are provided with a set of guidelines and rubrics (please see the attached *Supporting Documentation*). Each team is assessed by at least two UIAC members. At the end, the average score calculated and reported for program evaluation and improvement purposes.

Capstone Project Assessment by Industry Advisory Committee Members

UIAC members use a rating scale of 1-5 as described below to assess the capstone projects.

5 - Excellent – Student on average demonstrate mastery this outcome and could apply it effectively in a professional setting.

4 - Good – Students on average demonstrate good understanding of this outcome and could apply it in a professional setting.

3 - Fair – Students on average have an academic understanding of this outcome but may need further training in applying it in a professional setting.

2 - Weakness – Students have a familiarity with a particular outcome but could not use it in a professional setting.

1 - Deficiency – Students on average are unfamiliar with this outcome and are unprepared to use it in a professional setting.

N/A - Not Assessed – You do not have enough information to assess this outcome.

Methodology or data analysis strategy: Each capstone team is assessed by at least two UIAC members. At the end, the average score across the team members is calculated and reported for program evaluation and improvement purposes. The average score is then compared to the target which is that 70% of the capstone teams receive an average score of 4 or more (out of 5). It may be noted that the average score for each student team is calculated between the two-industry advisory committee member to generate the assessment data. Thus, for evaluation purpose, those individual level average scores are analyzed. For example, 70% of those individual level scores should be >=4 out of 5 for this outcome to be met.

Target 3

This outcome is considered met if more than 70% of the capstone project teams receive 4 or more out of 5 by UIAC members on this student outcome.

Finding 3: Met

Ability to design solutions for technical problems: Spring 2022 Capstone assessment Data by the UIAC members showed that 94% of the students received 4 or better rating for this outcome (i.e., design systems, components, or process).

Depth of Knowledge: Spring 2022 UIAC capstone assessment data shows that 98% of the teams received 4 or more out of 5 demonstrating that the ABET Student Outcome 1 (in-depth knowledge of industrial discipline) was adequately met.

Communication: Spring 2022 UIAC capstone assessment data shows that 94% of the teams received 4 or more out of 5 demonstrating that the ABET Student Outcome 1 (in-depth knowledge of industrial distribution discipline) was adequately met.

Conduct tests and measurement and analysis: Spring 2022 Capstone assessment Data by the UIAC members showed that 92% of the students received 4 or better rating for this outcome (i.e., ability to conduct tests and experiments). This objective is MET.

Ability to function in a team: Spring 2022 UIAC capstone assessment data shows that 90% of the teams received 4 or more out of 5 demonstrating that the ABET Student Outcome 5 (ability to function effectively in teams) was adequately met.

Integration of systems: Spring 2022 UIAC capstone assessment data shows that 93% of the teams received 4 or more out of 5 demonstrating that the ABET Student Outcome 6 (i.e., integration of systems using analytical and computational skills) was adequately met.

Use of Results

The course assessment data or capstone project assessment data (numerical scores) showed that all the outcomes were adequately met. However, there were few qualitative inputs from the UIAC members that provided useful information for continuous improvement. The ID program assessment coordinator proposed that the program use the UIAC qualitative inputs for continuous improvement in AY 2022-23. The faculty agreed with that proposal.

UIAC Inputs used for continuous improvement:

"Lack of data, industry sponsored project would be a better way to deal with this problem."

"Some topics did not have an in-depth analysis to back up the conclusions."

In order to address the shortcomings identified by the industry advisory committee members, following corrective actions are being planned for AY 22-23.

Curriculum Changes:

– Transition all students out of IDIS 464 to IDIS 443. This is an ongoing activity!
– Increase number of sections of IDIS 443 from two to three in Fall 2023
– Encourage students to take IDIS 443 by allowing substitution of other relevant courses such as IDIS 434 and/or a technical elective course. This will be a temporary measure until all students are transitioned to a new catalog.

Other changes:
– Assign industry project topics to as many students as possible. Goal is to assign every student team an industry sponsored project topic.
– Solicit data from the industry sponsor
– Changes in course deliverables
– Meeting requirements: students are required to meet every week (alternately, one week with faculty project coordinator and other week with industry sponsor; so, they are meeting with industry every other week)
– Limit project team size to 5 members

Implementation will begin in Fall 2022.

The UIAC member will assess the capstone project annually in Spring semester. If the assessment scores and qualitative feedback from the advisory committee members are positive, then we would know the improvement in the student outcomes. In addition, we will collect assessment data from students through their work and senior survey. Those data should also point to improvement in student outcomes.

During Aug 26 faculty meeting, the ID faculty unanimously approved the above-mentioned changes in the capstone projects to address the shortcomings identified by the UIAC members.

Status Update on a Previous Action

While Fall 2020 and Spring 2021 semesters course assessment data showed that this outcome was met. The other two measures: capstone project and graduating senior survey results showed that this outcome was not met. More specifically, Capstone assessment data for Fall 2020 showed that only 65% of the students received 4 or better (compared to a target of 70%), and Spring 2021 graduating senior survey data showed that 69% (against the target of 70%) of the students thought that the ID program prepared them well or extremely well prepared (4 or better out of 5).

The ID faculty met on Aug 6, 2021 and discussed the plan to improve this outcome. They determined that Capstone courses (IDIS 464 and IDIS 444) were appropriate place given that Capstone project requires students to design and develop a technical sale and supply chain services solution to ID problem.

We have added one lecture on design and system thinking in first capstone course (IDIS 464). In future (starting Fall 2022), there will be new Capstone course which will replace current IDIS 464. The IDIS 464 will be converted to IDIS 364 (Financial Operations Management in ID). The new course will emphasize design thinking, teach students about project management, and other tools that are needed to complete a successful capstone.

The process of transitioning to a new capstone course will take 5 semesters and should be completed by Spring 2024.

All assessment data collected in Fall 2021 and Spring 2022 (including graduating senior survey and the capstone assessment data by the UIAC members) showed an improvement in outcome 2. In other words, outcome 2 was adequately met.

Measure 1: Course Assessment Data Collection Methodology for Student Work

1. Faculty Assessment of Student work (Course Assessment Data)

This method provides an important direct measure of student outcomes. Every fall and spring semester, the course instructors assess student outcomes through various student works, such as homework assignments, quizzes, specific questions on exams, projects (in the form of written reports and presentations), case studies, and peer evaluations. The type of student work (or metric) assessed depends on the nature of the student outcome, and may vary from course to course. It may be noted that each outcome is assessed through multiple courses that each consist of multiple metrics. Table 4.4 shows a detailed list of the courses and metrics that were used in Fall 2018 to assess each individual student outcome as listed in Criterion 3.

Table 4.4: Courses and metrics used to assess student's work in Fall 2018

Outcome	Courses	Metrics used to assess the outcome
1	201	Test 1 (Part 1); Test 1 (Part 2); HW 6
	240	Quizzes (1, 2, 3, 4); Project Paper; Project Presentation; Exam 1 (Q:4, 21, 26, 28, 38, 42, 45); Exam 2 (Q:5, 6, 7, 11, 18, 32, 39); Exam 3 (Q:1, 11, 20, 22, 24, 29, 36)
	300	Midterm Exam; Final Exam; Class Lab; Lab Final
	301	Exam 1 (Problem 1); Exam 1 (Problem 3); Exam 2 (Problem 1); Exam 2 (Problems 2, 3, 4); Project; Lab
	330	Exam 1 (Q:5, 15, 20, 24, 30, 32, 39); Exam 2 (Q:8, 9, 20, 23, 25, 28, 33); Book Quizzes
	340	Project Presentation Content; Written Report Content; Exam 1 (Essay Q:1)
	343	Exam 1 (MC); Exam 1 (Problem); Exam 2 (MC); Exam 2 (Problem); Exam 3 (MC); Exam 3 (Problem)/Homework
	344	HW 1; HW 2; HW4; Exam 1 (Q: 2, 3, 7, 9, 16, 19); Exam 2 (Q: 3, 7, 8, 11, 14, 17); Final Project Report; Final Project Presentation
	400	Exam 1 (Section 1); Exam 2 (Section 1); Exam 3 (Section 1); Exam 4 (Section 1); Lab Total
	401	Exam 1 (Problem 1); Exam 1 (Problem 2); Exam 2 (Problem 1); Exam 2 (Problem 2); Exam 2 (Problem 3); Project; Case Study; Lab
	424	Exam 1 (Business); Exam 1 (Analytics); Spend Analysis; Case Study; Exam 2 (Business); Exam 2 (Analytics)
	433	Class I TEAM; Class II TEAM
	434	HW 2; HW 3; HW 4; HW 5; HW 6; Exam 1 (Section 2); Exam 2 (Section 2)
	444	Project
	450	HW; Quizzes; Exam; Case Study
	464	Exam 1 (Part A); Exam 2 (Part A)
2	300	Class Lab
	301	Exam 1(Problem 1 & 3); Exam 2 (Problem 1); Exam 2 (Problems 2, 3, 4); Lab
	400	Lab Total
	401	Exam 1 (Problem 1); Exam 1 (Problem 2); Exam 2 (Problem 1); Exam 2 (Problem 2); Exam 2 (Problem 3); Lab
	444	Video Discussion # 5; Exam 1 (Essays); Exam 2 (Essays); Project
	464	Capstone Del 03
3	201	Lab 4
	240	Project Paper; Project Presentation
	300	Class Lab
	301	Project; Lab
	330	Letter of Introduction; Book Review; Assignments (Role Playing); Lab Projects
	340	Project Presentation; Written Report Content
	344	HW 1; Final Project Report; Final Project Presentation
	400	Exam 1 (Section 1); Exam 2 (Section 1); Exam 3 (Section 1); Exam 4 (Section 1); Lab Total
	401	Project; Lab
	424	Case Study

	433	Coaching Paper; Leadership & Self-Deception Writing Assignment; Class I TEAM; Class II TEAM
	434	HW 2; HW 3; HW 6; Case Study
	444	Book Review #1; Book Review #2; Book Review #3; Book Review #4; Video Discussion #5; Exam 1 (Essays); Exam 2 (Essays); Project
	450	Case Study
	464	Capstone Del 01; Capstone Del 02; Capstone Del 04
4	201	Lab 4
	300	Class Lab; Lab Final
	301	Lab
	400	Lab Total
	401	Lab
5	201	Lab 4
	240	Project Paper; Project Presentation
	301	Team Evaluation
	330	Assignments (Role Playing); Lab Projects; Peer Evaluation
	340	Project Presentation; Peer Evaluation
	344	Final Project Report; Final Project Presentation
	400	Lab Total
	401	Team Evaluation
	424	Peer Evaluation
	433	Class I TEAM; Class II TEAM; Team Notebooks
	434	Peer Evaluation
	444	Peer Evaluation
	450	Case Study
	464	Peer Evaluation; In Class Assignments
6	201	Test 1 (Part 1); Test 1 (Part 2); Test 2 (Part 2); Test 3 (Part 2); HW 6
	300	Midterm Exam; Final Exam; Class Lab
	343	Exam 3 (Problem)/Homework
	400	Exam 1 (Section 1); Exam 2 (Section 1); Lab Total
	401	Case Study
	424	Spend Analysis; Case Study
	444	Project
	464	Exam 2 (Part B); Capstone Del 03
7	201	Test 1 (Part 1); Test 1 (Part 2); Test 2 (Part 2); Test 3 (Part 2); HW 6
	343	Exam 1 (Problem); Exam 2 (Problem); Exam 3 (Problem)/Homework
	424	Exam 1 (Analytics); Spend Analysis; Exam 2 (Analytics)
	434	HW 2; HW 3; HW 4; HW 5; HW 6; Exam 1 (Section 2); Exam 2 (Section 2)
	450	HW; Exam; Case Study
	464	Exam 1 (Part B); Exam 2 (Part C); Capstone Del 03

As shown in Table 4.3 above, there are at least five courses used to assess each outcome except for outcome 1. Because of the broad scope of the outcome 1, it is relevant to all 16 ID core courses therefore they are all used for assessment purposes.

Furthermore, the relationship between each course's learning objectives and the student outcomes is explicitly stated in each course's syllabus. The course instructors are responsible for making sure that the course learning objectives, and as a result, student outcomes are attained satisfactorily by the students taking the respective courses. At the end of each semester, each instructor is asked to complete the faculty course assessment form and submit it to the ID ABET coordinator.

In the following sections, examples from two courses are provided to illustrate the assessment methods and metrics used to evaluate the student outcomes in those courses.

Example 1: IDIS 434 Quality Processes for Distribution

The following table (Table 4.5) indicates how this course contributes to the achievement of the overall programmatic educational outcomes. Entries with an "H", "M", and "L", refer to high, medium, and low relevancy, respectively. (Note: this is also attached in the course syllabus for students to see).

Table 4.5: Connection between course objectives and student outcomes for IDIS 434

Course Objective	IDIS Program Educational Outcome							Assessment Method
	1	2	3	4	5	6	7	
Understand the modern quality management frameworks and philosophies (**Understand**)	M		M					Exams 1 & 2 (section 2)
Apply the concept of variability in quality and decision making (**Apply**)	H						M	HW3, HW4 Exams 1 & 2 (section 2)
Demonstrate an understanding of the basic concepts and techniques in quality management and process improvement in an industrial case (**Create**)	H		M				L	Case Study
Analyze the process data to determine if the process is out of control (**Evaluate**)	H			M				HW3, HW 6
Work in teams and demonstrate communication skills relating to quality (**Apply**)			H		H			Case Study
Demonstrate the understanding of basic probability and statistics in application to quality (**Apply**)	H						H	HW5, Exam 1-Section 2
Apply basic tools of quality to identify quality problems/improve processes in industrial distribution (**Apply**)	H						H	HW2, Exams 1 & 2 (Section 2)

More specifically, Table 4.6 depicts the outcomes-metrics matrix used by the instructor in this course to assess student work.

Table 4.6 Connection between student outcomes and course assessment metrics used in IDIS 434

IDIS 434		Metrics Used								
Student Outcomes	Description	HW2	HW3	HW4	HW5	HW6	Exam 1 Sec 2	Exam 2 Sec 2	Case Study	Peer Evaluation
1	an ability to apply knowledge, techniques, skills and modern tools of mathematics, science, engineering, and technology to solve broadlydefined engineering problems	X	X	X	X	X	X	X		
2	an ability to design systems, components, or processes for broadly-defined engineering technology problems appropriate to the discipline									
3	an ability toapply written, oral, and graphical communication in both technical and non-technical environments; and an ability to identify and use appropriate technical literature	X	X			X			X	
4	an ability toconduct standard tests and measurements, and to conduct, analyze, and interpret experiments									
5	an ability tofunction effectively as a member of a technical team									x
6	Accomplish the integration of systems using appropriate analytical, computational, and application practices and procedures.									
7	Apply knowledge of probability, statistics, engineering economic analysis and cost control, and other technical sciences and specialties necessary in the field of industrial engineering technology.	x	x	x	x	x	x	x		

Table 4.7: Example of assessments of student work with actual grades in IDIS 434 and equivalent metric scores (Note: only partial table is shown here)- Fall 2018

Graduating Senior Survey Data Collection Methodology

Toward the end of every fall and spring semester, a comprehensive survey is sent out to all graduating ID seniors for them to fill out. The survey asks the graduating seniors about 85 questions that cover a wide range of topics, including how well the ID courses prepared them to achieve various outcomes, their graduation time, internship experience, job offer status, faculty interactions, advising relevancy, lab experience, and, of course, their self-assessment with respect to ABET Criterion 3, student outcomes. The typical response rate for this survey is nearly 70%, which is considered very high and provides reliable assessment data. However, since it is a self-assessment, this method is considered an indirect measure. The survey questions that are related to Criterion 3, student outcomes, are shown below (see Table 1).

Table 1: Graduating senior survey questions and related student outcome

Survey Question Number	Question: Please tell us how you think the courses taken at Texas A&M (ID Program) have prepared you in the following areas:	ABET Student Outcome
27-1	An ability to apply knowledge, techniques, skills and modern tools of mathematics, science, engineering, and technology to solve broadly defined engineering problems	1
27-2	An ability to design systems, components, or processes for broadly-defined engineering technology problems appropriate to the discipline	2
27-3	An ability to apply written, oral, and graphical communication in both technical and non-technical environments; and an ability to identify and use appropriate technical literature	3
27-4	An ability to conduct standard tests and measurements, and to conduct, analyze, and interpret experiments	4
27-5	An ability to function effectively as a member of a technical team	5
27-6	Accomplish the integration of systems using appropriate analytical, computational, and application practices and procedures.	6
27-7	Apply knowledge of probability, statistics, engineering economic analysis and cost control, and other technical sciences and specialties necessary in the field of industrial engineering technology.	7

Scoring rubric: Students self-assess as to how well they feel the IDIS courses have prepared them with respect to the abovementioned outcomes on a scale of 1-5, where 5 = Extremely well prepared, 4 = Well prepared, 3 = Acceptably prepared, 2 = Needs Improvement, and 1 = Needs considerable improvement.

Measure 3: Capstone Project Assessment Instrument

Texas A&M University
Industrial Distribution Program
Senior Capstone Project Review

Guidelines
- The purpose of this Capstone project review is to assess the student learning outcomes that the students may have acquired from courses and other curricular activities in the ID program. We are gathering this data for our program accreditation purpose.
- The Capstone projects are expected to provide an overview of student's ability to integrate the knowledge and skills that they may have gained in various courses in the ID program.
- If you do not feel you can adequately assess an outcome, please give it a score of N/A. However, with that said, try to access as many of the outcomes as possible.
- Please read over this form and develop an understanding of the grading system and the outcomes being assessed. If you have questions, please address them to Dr. Bimal Nepal via email to nepal@tamu.edu .
- *Please use the comment sections to give specific comments on strengths and weaknesses of our students or to offer improvement suggestions.*

Scoring (1-5)
5   **Excellent**– Student on average demonstrate mastery this outcome and could apply it effectively in a professional setting.
4   **Good** – Students on average demonstrate good understanding of this outcome and could apply it in a professional setting.
3   **Fair** – Students on average have an academic understanding of this outcome but may need further training in applying it in a professional setting.
2   **Weakness** – Students have a familiarity with a particular outcome but could not use it in a professional setting.
1   **Deficiency** – Students on average are unfamiliar with this outcome and are unprepared to use it in a professional setting.
N/A   **Not Assessed** – You do not have enough information to assess this outcome.

We greatly appreciate your time and input to ID program. All the Capstone project evaluation data will be analyzed and only aggregated data will be reported for ABET and other program assessment purposes.

Student Name: _____   **Evaluator Name:** _____

ABET Student Outcome	Description	Score
1. an ability to apply knowledge, techniques, skills and modern tools of mathematics, science, engineering, and technology to solve broadly defined engineering problems	Based on your Capstone project review please rate the students with respect to their ability to apply such ID skills as supply chain management, logistics, and sales engineering to solve distribution problems.	
2. an ability to design systems, components, or processes for broadly-defined engineering technology problems appropriate to the discipline	Based on your Capstone project review please rate the students with respect to their ability to design and develop the systems and processes to solve broadly defined industry distribution problems such as sales system, warehouse systems, logistics systems, and supply chain management problems.	
3. an ability to apply written, oral, and graphical communication in both technical and non-technical environments; and an ability to identify and use appropriate technical literature	Based on your Capstone project review please rate the students with respect to their ability to communicate both in a technical and non-technical setting. For example, how well the students can communicate in writing, oral presentation including graphics. How effectively the students identified and used any technical literature while working on their project?	
4. an ability to conduct standard tests and measurements, and to conduct, analyze, and interpret experiments	Based on your Capstone project review please rate the students with respect to their ability to conduct lab test (or other forms of experiments), take measurements, analyze and interpret data to improve industrial distribution processes.	
5. an ability to function effectively as a member of a technical team	Based on your Capstone project review please rate the students' ability to work in a group project. For example, how well students understood the project and may have interacted with team members? It also includes the students' ability to organize, and manage a technical project team.	
6. an ability to accomplish the integration of systems using appropriate analytical, computational, and application practices and procedures.	Based on your Capstone project review please rate the students with respect to their ability to solve problems or develop solutions by integrating various aspects of distribution systems such as sales, warehousing, and logistics systems. It also includes the students' ability to compute and analyze financial, operational, or customer service metrics to develop best practices.	
7. an ability to apply knowledge of probability, statistics, engineering economic analysis and cost control, and other technical sciences and specialties necessary in the field of industrial engineering technology.	Based on your Capstone project review please rate the students with respect to their ability to apply the data analytics, quality control techniques, financial analysis, technical & engineering sciences in the field of industrial distribution.	

Please Use this space (or next page) for any additional comments.