

BS Industrial Technology
Annual Program Report Template

Year:	2022
Program:	BS Industrial Technology
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Summary of Continuous Improvement Efforts since Last Report

Provide a brief description of how assessment results have been used for program improvement. Point to a specific example of how an assessment provided the program with data it could use for improvement and what that improvement was, if possible, also show evidence of the improvement. You may look at data from the two previous academic years to support this case.

Respond here:

1. Issues with using figures and list

Identification: The 2022 department level assessment of student work showed that students were not using graphics and list in reports in INEN 4315.

Improvement: The department is adding 4 lectures on technical writing to INEN 3300 Introduction to IT to teach students how to write effective technical documents with an emphasis on using list of items and figures. The department is also adding new lectures on MS Word features to our INEN 3360 Computer Application Course.

Result: This improvement was identified in late fall 2022. The improvement to the courses will be made in fall 2023. We hope to see improvements in Fall of 23 since the improvement will be taught early in the semester.

2. INEN 4315 Industrial Management Fall 2020 to Fall 2021

Identification: INEN 4315 “Industrial Management” is for the online BSIE, BSIE 2+2 and BSIT programs. It is an ABET listed course and topics are related to contemporary issues, life-long learning, ethics and impacts of engineering solutions. Project given in this course is related to contemporary issues and contemporary issues. Instructor realized that explanation of contemporary issues with live session would be good.

Improvement: Instructor created some live sessions to explain project expectations. Attendance was not mandatory for this session, but the session were recorded via collaborate ultra. In this case, students can watch the live session video for project requirements.

Result of Improvement: Project writing quality as well as the selection of topic for projects were significantly improved.

3. INEN 4354 Lean Manufacturing

Identification: INEN 4354 “Lean Manufacturing” is for the online BSIE, BSIE 2+2 and BSIT programs. The content of the course needed to be improved.

Improvement 1: Instructor had meetings with one of the Industrial Engineering Advisory Council Members who has experience in teaching Lean Manufacturing. He came to the class as a guest speaker as well. Instructor improved chapters after these interactions such as in core concepts of Lean such as VSM, JIT, takt time, cellular manufacturing, etc. New improved videos had been developed.

Result of Improvement 1: The lean manufacturing course received good enrollment and interest from students.

4. INEN 4354 Lean Manufacturing

Identification: INEN 4354 “Lean Manufacturing” is for the online BSIE, BSIE 2+2 and BSIT programs. The instructor realized that project was needed to be explain with live session along with some examples of previous year’s projects. In addition, Instructor published a book with Dr. Phillips who helped to improve the class.

Improvement: The instructor decided to hold live sessions about project expectations. Attendance was not mandatory for this session, but the sessions were recorded via collaborate ultra. In this case, students can watch the live session videos and do not miss the opportunity to learn from the live sessions. Moreover, new book had been introduced as a supplementary book and new slides had been added to the course. One of the authors of the new book is the course instructor.

Result of Improvement: The quality of the project deliverable significantly improved. Students were very satisfied with the addition of the material.

5. INEN 3380 – Work Design (Online, Face-to-Face) - 2022

Identification: Laboratories are required in the course. Students have struggled with writing an Executive Summary. Executive Summaries are an essential skill that needs to be mastered for their capstone project and working in industries.

Improvement: A new laboratory was created for students to practice and improve writing an Executive Summary.

Result: The new Executive Summary laboratory average grade was 83 for the Spring 2022 semester and 86 for Fall 2022. Comparing these scores to the Executive Summary portion of the first laboratory assignment in Fall 2021, there was a 55% improvement. The Executive Summary lab was successful in achieving the goal of improving the student's skills in writing an Executive Summary.

6. INEN 3380 – Work Design (Online, Face-to-Face) – 2023

Identification: In previous semesters, students were given “suggested” homework problems to work on in preparation for taking quizzes and exams. Most students did not do these problems. Scores on exams were not as good as they should be.

Improvement: Homework is now given with a weighting of 10% on the final grade.

Result: Data collected will be analyzed at the end of the Spring 2023 semester.

7. INEN 2301 and INEN 3330 – Applications of Quantitative Methods and Engineering Economy

Identification: These courses use a website provided by the publisher of the textbook. Students were having difficulties maneuvering through the website. This inability caused students to miss out on learning tools provided by the publisher.

Improvement: Videos were produced titled “A Tour of Mylab.” In the video students are shown how to navigate the website and unlock the tools provided by the publisher.

Result: Data collected will be analyzed at the end of the Spring 2023 semester.

8. INEN 4396 Automated Engineering Systems (elective)

Identification 1: PLC (Programmable Logic Controller) is the brain of the automated industrial control systems and is an important chapter in the course. Prior to 2020, a low-cost PLC Trilogi (made in Canada) was adopted due to the free software license it offered to students. But the software was outdated, and not widely used in industry.

Improvement 1: In 2020, the instructor decided to use a much more popular Allen-Bradley MicroLogix1100, an entry level, but extremely popular industrial PLC as the lab equipment, and developed a teaching panel equipped with the PLC and various I/Os. Detailed instruction of download, installation and configuration of a complete programming/debugging/simulation environment was shared with students in blackboard, which consists

of RSLogix 500, RSLogix 500 Emulate & RSLinx, and all of them are free for educational purpose. Students had exposure to the latest and industrial standard PLC hardware and software.

Results of improvement 1: The quality of the answers to the homework assignments on PLC programming was significantly improved. Students seem to be more motivated to learn, knowing that the technology was widely used in industry.

Identification 2: Distributed Control Systems (DCS) is widely used in the local petrochemical industries and is the forefront of the development in automation control at system or plant level. In the past, the course only conceptually discussed Distributed Control Systems (DCS) and Supervisory Control and Data Acquisition (SCADA) with no lab for it.

Improvement 2: With the establishment of the Emerson Advanced Technology Lab in November 2021, we have the latest Emerson DeltaV DCS system and the Performance Learning Platform (PLP) installed on campus. The PLP platform pumps water from tank 1 to tank 2 and measures flow, tank level, pressure and temperature through Rosemount, Micro Motion and Fisher devices controlled by the newest DeltaV PK controller. The instructor took the advantage of the access to the latest DCS system, and developed two lab sessions for the students, to give students hands-on experience on configure and control of DCS.

Results of improvement 2: The labs were well received by students. Some students expressed strong desire to learn more about the DCS controller, which motivated the instructor to develop a new course on DeltaV DCS Control System Implementation and Control in Spring 2023.

11. INEN 4351 Production and Inventory Systems

Identification: The lecture talks about individual ways to make supply equal demand, but do not fully describe how you can use multiple approaches to achieve this goal. Also, the interrelationships between lead time, inventory, price, capacity and demand were not fully presented.

Improvement: I redesigned several lectures in the course including the introduction lecture to discuss multiple ways to make supply equal demand. The theme is now the multiple ways to make supply equal demand with one lecture on price (revenue management) and marketing. I introduce this theme in the first lecture the slide appears in multiple lectures.



Result: The student evaluations in the course are generally positive and the change did not impact the evaluations.

9. F2.08 Requirements for Continuous Improvement

Identification: Faculty were not documenting improvements in courses.

Improvement: Required faculty to document improvements in annual performance review (F2.08) under teaching section. For year 1, I asked all faculty to go 4 years back. In future years, new improvements plus tracking results of existing improvements will be included. The improvements are used a significant part of the annual evaluation (teaching section is 50% for most faculty).

Result: Documented 30 pages of course level improvements. These improvements are shared among the faculty to share best practices and understand updates in courses at the instructor level.

Program Highlights Since Last Report

Identify and briefly discuss any programmatic curriculum changes made since the last report (e.g. new courses, course changes, SLO changes, course deletions).

Respond here: Added a special topics course (INEN 4399: ST International Logistics and INEN 4399: ST Logistics Geography).

Table 1. Assessment Results and Analyses for Current Cycle.

STAGE 1: PLAN				STAGE 2: DO		STAGE 3: STUDY
Departmental Student Learning Goal	Program Student Learning Outcome	Assessment	Assessment Method/Location	Benchmark Expectations	Data Results	Actions/Goals Based on Data Results* What do the data tell you? How will you use this data? How were data from the last cycle used to make changes during this cycle, and What were the results of those changes?
Industrial technology knowledge application	1 . Understanding of Engineering Management	Student work in INEN 4315 (final report)	Review of Work by faculty who do not teach the course / Online	Rate on Likert scale 4- Good, 3 - Average, 2 - Marginal, 1 - Unacceptable At least 60% of students must be in the good and average ranking. At least 80% of students must be in the good, average, marginal rankings.	Average = 3 Marginal and Unacceptable = 10% Unacceptable = 0%	
Industrial technology knowledge application	2. Ability to Apply Engineering Management to a business problem	Student work in INEN 4315 (final report)	Review of Work by faculty who do not teach the course / Online	Same as above	Average = 3.1 Marginal and Unacceptable = 10% Unacceptable = 0%	
Industrial technology knowledge application	3. Considering factors beyond cost including public health, safety, and welfare, as well as	Student work in INEN 4315 (final report)	Review of Work by faculty who do not teach	Same as above	Average = 3.4 Marginal and Unacceptable = 10%	

	global, cultural, social, and environmental.		the course / Online		Unacceptable = 0%	
Written, oral and graphical communication	1. Grammar	Student work in INEN 4315 (final report)	Review of Work by faculty who do not teach the course / Online	Same as above	Average = 3 Marginal and Unacceptable = 10% Unacceptable = 0%	
Written, oral and graphical communication	2. Document Organization	Student work in INEN 4315 (final report)	Review of Work by faculty who do not teach the course / Online	Same as above	Average = 2.2 Marginal and Unacceptable = 90% Unacceptable = 0%	An improvement plan was added for INEN 3300 and INEN 3360 to teach students the importance of lists and graphics in reports. These improvements will be made in fall 2023 and Spring 2024.
Written, oral and graphical communication	3. Conclusion / Summary of Information	Student work in INEN 4315 (final report)	Review of Work by faculty who do not teach the course / Online	Same as above	Average = 2.8 Marginal and Unacceptable = 30% Unacceptable = 0%	
Written, oral and graphical communication	4. Effective use of pictures, graphs and tables	Student work in INEN 4315 (final report)	Review of Work by faculty who do not teach the course / Online	Same as above	Average = 1 Marginal and Unacceptable = 100% Unacceptable = 100%	An improvement plan was added for INEN 3300 and INEN 3360 to teach students the importance of lists and graphics in reports. These improvements will be made in fall 2023 and Spring 2024.
Written, oral and graphical communication	5. References	Student work in INEN 4315 (final report)	Review of Work by faculty who do not teach the course / Online	Same as above	Average = 2.8 Marginal and Unacceptable = 20% Unacceptable = 0%	

Analyze and interpret data, and use engineering judgment to draw conclusions	1. Evaluate where an engineering management methodology can and cannot be used.	Student work in INEN 4315 (final report)	Review of Work by faculty who do not teach the course / Online	Same as above	Average = 3.1 Marginal and Unacceptable = 20 % Unacceptable = 0%	
Analyze and interpret data, and use engineering judgment to draw conclusions	2. Discuss the advantages and disadvantages of an engineering management methodology.	Student work in INEN 4315 (final report)	Review of Work by faculty who do not teach the course / Online	Same as above	Average = 3.3 Marginal and Unacceptable = 20% Unacceptable = 0%	

Assessment in INEN 2301 Quantitative Methods

Stage 1: PLAN			STAGE 2: DO		Stage 3: STUDY	
General Education Competencies Addressed in this Course:	Assessment Method(s) – e.g. pre/post tests, embedded questions, portfolio evaluation, rubric-scored essay; list only activities for which you are reporting assessment data	Proficiency – e.g. the proficient student will correctly answer 5 out of the 6 embedded questions on the final exam	Benchmark – e.g. 80% of students taking the final exam will correctly answer 5 of the 6 embedded questions on the final exam	Results of course assessment(s)	Analysis of results – e.g. strengths and weaknesses What does this data tell you? How will you use this data? How were data from the last cycle used to make changes during this cycle, and what were the results of those changes?	Recommendations for Course based on assessment
Communication (required)		Shows ability to define key terms and concepts,	80% of students demonstrate an	83.3% successful	The changes implemented in the course have	

	Review of student work on exam for related questions.	determine random variable, find and interpret the covariance and correlation between two random variables, find and interpret the expected value and standard deviation or variance of random variables.	ability to do the tasks.		resulted in good performance on the tasks.	
Critical Thinking (required)	Review of student work on exam for related questions.	Is able to use the language of probability to represent uncertain outcomes as random variables, manipulate the mean, variance, and standard deviation of random variables when transformed, and	80% of students demonstrate an ability to do the tasks.	88%		

		find the mean, standard deviation, and variance of random variables.				
Select One: <input type="checkbox"/> Empirical & Quantitative Skills <input type="checkbox"/> Teamwork <input type="checkbox"/> Social responsibility <input type="checkbox"/> Personal Responsibility	Review of student work on exam for related questions.	Shows a good ability to speak, read, and understand the language and concepts of probability, find complements, intersections, and unions of events, work with the Law of Large Numbers, apply rules of probability.	80% of students demonstrate an ability to do the tasks.	94%		

Select One: x___Empirical & Quantitative Skills ___Teamwork _Social responsibility ___Personal Responsibility	Review of student work on exam for related questions.	Has a good ability to distinguish joint, marginal, and conditional probabilities, use the rules and notation of probability, find conditional probabilities, and use conditional probability to describe dependent events.	80% of students demonstrate an ability to do the tasks.	83%	We need to work on more direct measures of social responsibility.	

INEN 4351

Stage 1: PLAN			STAGE 2: DO		Stage 3: STUDY	
General Education Competencies Addressed in this Course:	Assessment Method(s) – e.g. pre/post tests, embedded questions, portfolio evaluation, rubric-scored essay; list only	Proficiency – e.g. the proficient student will correctly answer 5 out of the 6 embedded questions on the final exam	Benchmark – e.g. 80% of students taking the final exam will correctly answer 5 of the 6 embedded questions on the final exam	Results of course assessment(s)	Analysis of results – e.g. strengths and weaknesses What does this data tell you? How will you use this data? How were data from	Recommendations for Course based on assessment

	activities for which you are reporting assessment data				the last cycle used to make changes during this cycle, and what were the results of those changes?	
Student Engagement	Average hours spent in the course	Median hours in the course.	45 hours	32 hours	Given students can complete homework and study without being log in to the blackboard, the number of hours is reasonable (maybe slightly low.	Continue to examine this metric. Make quizzes specific to videos.

Table 2. Continuous Improvement Results Since Last Report

Stage 4: ACT		
Actions/Goals Based on Data Results <i>*Copy last cycle's actions/goals and report on progress toward continuous improvement on those here.</i>	Status <i>C=Complete P=Progressing N=No Action Taken</i>	Discussion of Status <i>If C, describe efforts that led to accomplishment of actions/goals. If P, provide update on progress made toward accomplishing actions/goals and what tasks remain If N, discuss why action toward accomplishing actions/goals has been delayed and what work will be initiated toward accomplishment.</i>
See improvement and results in section one.		
Improve the BSIT with additional technical electives.	N	New action item for next year. Currently under development with faculty. Hope to report several new courses next year.
Measure engagement in more courses	P	Just started examining engagement metrics (time spent in blackboard and others) with Dr. Curry and Gary Yenzen conducting study on these metrics.
Using figures and list	P	Use of figures, tables and bulleted lists will be stresses in INEN 3300 starting in fall 2023. Issue identified in spring 2022 based on fall 2022 data.