

## BS Industrial Technology

### Annual Program Report Template

<b>Year:</b>	2023-2024
<b>Program:</b>	BS Industrial Technology
<b>Contact Person (include email &amp; phone#)</b>	James Curry <a href="mailto:james.curry@lamar.edu">james.curry@lamar.edu</a> 2488025891

#### 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.*

The BSIT degree is an algebra-based degree that teaches topics related to the management of manufacturing systems. Almost all students are transfer students from Associates of Applied Science Degree in Instrumentation, Process Operations, Machining, or related areas. The outcomes for the BSIT program are:

1. an ability to apply modern engineering management approaches and strategies.
2. an ability to communicate effectively with a range of audiences.
3. an ability to use modeling to support manufacturing systems.

The curriculum map between outcomes and courses for BSIT is shown in Table 1. The BSIT is a transfer degree with up to 33 hours of technical credit goes towards a basic understanding of a technology related to manufacturing systems and background. The degree also has 6 upper division electives.

Table 1. Map of where outcomes are primarily (P) and secondarily (S) taught.

Course/ Outcome	1 . an ability to apply modern engineering management approaches and strategies.	2. an ability to communicate effectively with a range of audiences.	3. an ability to uses modeling to support manufacturing systems.
INEN 3300 - Industrial Engineering – Introduction	P	S	S
INEN 3330 - Engineering Economy	S		P
INEN 3360 - Computer Applications in Industrial Engineering			P
INEN 4301 - Quality Control Applications			P
INEN 4315 - Industrial Management (shared BSIE)	P	P	
INEN 4316 - Industrial and Product Safety (shared BSIE)		P	
INEN 4351 - Production and Inventory Systems	P	S	P
INEN 4369 - Engineering Management	P	P	

The steps of the process are as follows. 1. Assessment Committee, with input from the faculty and constituency group, constructs rubrics. For consistency, all rubrics are designed with a 4-point scale, including specific performance criteria, and have a minimum performance standard set to an average above 2.5 on the 4-point scale. 2. The faculty discusses the performance criteria in the rubrics. 3. The course instructor grades the student work to be included in the students' course grade. 4. The faculty Assessment Committee then independently assesses the student work with the rubric for that outcome(s). A minimum of three faculty members must evaluate the student work. 5. The results of the assessments are tabulated. 6. Improvement plans are written for every area not meeting the performance standard. Improvement plans can also be generated to improve items meeting our standards. 7. The Faculty Assessment Committee and appropriate faculty members review the assessment data and develop suggest continuous improvement plans when applicable. Four courses are used in this assessment process. The program selected courses that best demonstrate how well an outcome is being achieved. While the outcomes are taught in earlier courses including courses outside of our department, the program generally selected courses towards the end of the degree plan to focus our analysis on outcomes achieved by students who are near graduation.

The steps of the process are: 8. Assessment Committee, with input from the faculty and constituency group, constructs rubrics. For consistency, all rubrics are designed with a 4-point scale, including specific performance criteria, and have a minimum performance standard set to an average above 2.5 on the 4-

point scale. 9. The faculty discusses the performance criteria in the rubrics. 10. The course instructor grades the student work to be included in the students' course grade. 11. The faculty Assessment Committee then independently assesses the student work with the rubric for that outcome(s). A minimum of three faculty members must evaluate the student work. 12. The results of the assessments are tabulated. 13. Improvement plans are written for every area not meeting the performance standard. Improvement plans can also be generated to improve items meeting our standards. 14. The Faculty Assessment Committee and appropriate faculty members review the assessment data and develop suggest continuous improvement plans when applicable.

The assesement calendar is build on the map between outcomes and courses (Table 2). Outcomes 1 and 2 are assessed in year 1 based on student work in INEN 4315 (final report). All Outcomes are assessed in INEN 4369 based on test performance on select questions. A two-year cycle is employed.

Table 2. Assessment calendar.

Outcome	2022-2023	2023-2024
1 . an ability to apply modern engineering management approaches and strategies.	INEN 4315 (Class Final Report)	INEN 4369 (Projects)
2. an ability to communicate effectively with a range of audiences.	INEN 4315 (Class Final Report)	INEN 4369 (Projects)
3. an ability to uses modeling to support manufacturing systems.		INEN 4369 (Projects)

Rubrics were developed to assess student work for the 3 outcomes. They are displayed in Tables 3a-3c.

Table 3a. Rubric for an ability to apply modern engineering management approaches and strategies.

<b>an ability to develop and apply modern engineering management approaches and strategies.</b>	4 - Exemplary	3 - Acceptable	2 – Marginal	1 - Unacceptable
<b>Understanding of Engineering Management</b>	Understands the concepts of multiple engineering management methods.	Understands the concepts of an engineering management approach	Limited understanding of key concepts.	Significant confusion about basic concepts of engineering management.
<b>Compare different engineering management approaches</b>	Explains the difference between engineering management approaches and identify where each is useful.	An understanding of the approaches and differences.	An understanding of the approaches without being able to explain the differences.	No clear understanding of the approaches.
<b>Considering factors beyond cost including public health, safety, and welfare, as well as global, cultural, social, and environmental.</b>	Multiple factors are considered and evaluated.	Multiple factors are considered with limited evaluation.	Analysis is mostly based on a single factor.	Single factor is considered in decision making.

Table 3b. Rubric for an ability to communicate effectively with a range of audiences.

<b>an ability to communicate effectively with a range of audiences.</b>	<b>4 - Exemplary</b>	<b>3 - Acceptable</b>	<b>2 – Marginal</b>	<b>1 - Unacceptable</b>
<b>Organization</b>	Information is very organized with well-constructed paragraphs and subheadings.	Information is organized with well-constructed paragraphs.	Information is organized, but paragraphs are not well-constructed.	The information appears to be disorganized.
<b>Amount of Information</b>	All topics are addressed and all questions answered with at least 2 sentences about each.	All topics are addressed and most questions answered with at least 2 sentences about each.	All topics are addressed, and most questions answered with 1 sentence about each.	One or more topics were not addressed.
<b>Quality of Information</b>	Information clearly relates to the main topic. It includes several supporting details and/or examples.	Information clearly relates to the main topic. It provides 1-2 supporting details and/or examples.	Information clearly relates to the main topic. No details and/or examples are given.	Information has little or nothing to do with the main topic.
<b>Mechanics</b>	No grammatical, spelling, or punctuation errors.	Almost no grammatical, spelling, or punctuation errors	A few grammatical, spelling, or punctuation errors.	Many grammatical, spelling, or punctuation errors.
<b>Paragraph Construction</b>	All paragraphs include introductory sentence, explanations or details, and concluding sentence.	Most paragraphs include introductory sentence, explanations or details, and concluding sentence.	Paragraphs included related information but were typically not constructed well.	Paragraphing structure was not clear and sentences were not typically related within the paragraphs.

Table 3C. Rubric for an ability to uses modeling to support manufacturing systems.

<b>an ability to uses modeling to support manufacturing systems</b>	4 - Exemplary	3 - Acceptable	2 – Marginal	1 - Unacceptable
<b>Math modeling understanding</b>	Understand the role of math modeling in manufacturing systems.	Some understanding the role of math modeling in manufacturing systems.	Use some math-based tools that do not adequately capture the real system with small error	No use of math-based modeling.
<b>Explanation</b>	Student adequately explains the model and solution procedure.	Student provides a brief explanation without clear steps.	Limited explanation of model and solution procedures.	No explanation of model and solution procedures.

Acyut Kaneria, Dr. Curry and Dr. Tokgoz reviewed INEN 4369 projects. Dr. Curry compiled the results. The results of the assessment and improvement plans were shared with the faculty for input.

Degree: BS Industrial Technology 2023-2024 Assessment Plan									
	Student Learning Outcome #1	1 . an ability to apply modern engineering management approaches and strategies.							
PLAN	Assessment Method(s)	(1) INEN 4369 (Projects)							
	Proficiency	Minimum acceptable standard 75% (3 out of 4)							
DO	Benchmark	75% of students to the proficiency of 75% (3 out of 4)							
	Results of Assessment	The standard was not meet in all rubric areas. The reports lacked a comparison of different engineering management techniques.							
	<table><tr><td>Rubric Area</td><td>Percent Achievement</td></tr><tr><td>Understanding of Engineering Management</td><td>84%</td></tr><tr><td>Compare different engineering management approaches</td><td>69%</td></tr><tr><td>Considering factors beyond cost including public health, safety, and welfare, as well as global, cultural, social, and environmental.</td><td>73%</td></tr></table>		Rubric Area	Percent Achievement	Understanding of Engineering Management	84%	Compare different engineering management approaches	69%	Considering factors beyond cost including public health, safety, and welfare, as well as global, cultural, social, and environmental.
Rubric Area	Percent Achievement								
Understanding of Engineering Management	84%								
Compare different engineering management approaches	69%								
Considering factors beyond cost including public health, safety, and welfare, as well as global, cultural, social, and environmental.	73%								
STUDY	Analysis of Results	The standard not being meet was due to poor writing and a lack of references in several of the reports.							
ACT	Improvement Plan for 2024-2025	1. Redesign INEN 3300 to teach technical writing skills. This course is early in the program, so the change should fix the issues with writing in later courses. The redesign will include adding 3 new weeks on citation, use of graphics, and technical writing to improve students’ ability to construct essays. Three new homework and quizzes will be added on this topic. This							

		<p>improvement plan will be executed in fall 2024.</p> <p>2. Redesign INEN 3360 Computer Applications to include additional lectures on citation in word and development of flow charts and similar graphics.</p>
--	--	---

Degree: BS Industrial Technology 2023-2024 Assessment Plan													
	Student Learning Outcome #1	2. an ability to communicate effectively with a range of audiences.											
PLAN	Assessment Method(s)	(1) INEN 4369 (Projects)											
	Proficiency	Minimum acceptable standard 75% (3 out of 4)											
DO	Benchmark	75% of students to the proficiency of 75% (3 out of 4)											
	Results of Assessment	<div>The students did not achieve the benchmark. Across all rubric areas the benchmark was not achieved.</div> <table><tr><td>Rubric Area</td><td>Percent Achievement</td></tr><tr><td>Organization</td><td>77%</td></tr><tr><td>Amount of Information</td><td>65%</td></tr><tr><td>Quality of Information</td><td>34%</td></tr><tr><td>Mechanics</td><td>57%</td></tr><tr><td>Paragraph Construction</td><td>46%</td></tr></table>	Rubric Area	Percent Achievement	Organization	77%	Amount of Information	65%	Quality of Information	34%	Mechanics	57%	Paragraph Construction
Rubric Area	Percent Achievement												
Organization	77%												
Amount of Information	65%												
Quality of Information	34%												
Mechanics	57%												
Paragraph Construction	46%												



<b>S T U D Y</b>	<b>Analysis of Results</b>	Technical writing is a challenge for the BSIT students. The key problem is quality of information and structure of the document.
<b>ACT</b>	<b>Improvement Plan for 2024-2025</b>	<ol style="list-style-type: none"> <li>1. Redesign INEN 3300 to teach technical writing skills. This course is early in the program, so the change should fix the issues with writing in later courses. The redesign will include adding 3 new weeks on citation, Google Scholar, use of graphics, and technical writing to improve students' ability to construct essays. Three new homework and quizzes will be added on this topic. This improvement plan will be executed in fall 2024.</li> <li>2. Redesign INEN 3360 Computer Applications to include additional lectures on citation in word and development of flow charts and similar graphics.</li> </ol>

Degree: BS Industrial Technology 2023-2024 Assessment Plan							
	Student Learning Outcome #3	3. an ability to uses modeling to support manufacturing systems					
PLAN	Assessment Method(s)	INEN 4369 (Projects)					
	Proficiency	Minimum acceptable standard 75% (3 out of 4)					
DO	Benchmark	75% of students to the proficiency of 75% (3 out of 4)					
	Results of Assessment	Students achieved the results for this learning outcome. The project did not require math modeling, so that part of the rubric was not assessed. Over 75% of students were able to e					
	<table><tr><td>Rubric Area</td><td>Percent Achievement</td></tr><tr><td>Math modeling understanding</td><td>NA</td></tr><tr><td>Explanation</td><td>76%</td></tr></table>		Rubric Area	Percent Achievement	Math modeling understanding	NA	Explanation
Rubric Area	Percent Achievement						
Math modeling understanding	NA						
Explanation	76%						
S T U D Y	Analysis of Results	The standard was meet.					
ACT	Improvement Plan for 2024-2025	None based on this assessment.					

