**Annual Assessment Report for 2020-2021 AY**

Department/Program: Department of Industrial Technology Degree: BS Assessment Coordinator: Daming Zhang

1. Please list the learning outcomes you assessed this year.

**a. Direct Measure** (CTM Standard exam): **Goal B (**Management)

The second goal (B. Management Goal) for the Industrial Technology program is to develop management competency based on students’ career objectives. There are 160 questions in 10 categories, which are related to the four SLOs for Goal B: managing of projects (B.1), managing of quality systems (B.2), managing of production process (B.3), and managing safety programs (B.4).

The Goal B, SLO 1 ~ 4 were assessed using the national standard CTM (Certified Technology Manager) exam in the 2020-21 academic year.

**b. Direct Measure** (IT 199 Paper): **Goal D** (Research)

The fourth goal (D. Research Goal) for the Industrial Technology program is to apply research principles and methodologies appropriate to students’ career objectives. The first outcome (D.1) is to let students be able to develop research and problem-solving skills. The second outcome (D.2) is to let students be able to propose, plan and execute independent projects incorporating various technical and managerial components. And the third outcome (D.3) is to let students be able to present findings from technical and scientific research.

The Goal D, SLO 1, 2, 3 were assessed by evaluating the IT 199 papers.

**c. Indirect Measure** (Exit Survey): **Goal A** (Technical), **Goal B** (Management), **Goal C** (Leadership), **Goal D** (Research), **Goal E** (Lifelong)

We used an Exit Survey to indirectly assess all of our learning outcomes including those classified under the Technical, Management, Leadership, Research, and Lifelong goals.

**2.** What assignment or survey did you use to assess the outcomes and what method (criteria or rubric) did you use to evaluate the assignment?

• **Standard exam** (CTM Standard exam): Direct Measure

“The Association of Technology, Management, and Applied Engineering (ATMAE)” is the professional society for Industrial Technology major. ATMAE administers several professional exams which are partial requirements for different levels of professional certificates. Among those standard exams, CTM (Certified Technology Manager) exam is the most appropriate for BSIT major.

For the current version of CTM exam, students need to answer 160 questions in two hours. There are 10 categories which covers our Goal B (Management goal) of developing management competency. We can use this CTM exam to assess student

learning outcomes of B.1 – managing projects, B.2 – managing quality systems, B.3 – managing production process, and B.4 – managing safety programs. For the 2020- 2021 academic year, we tried to focus on those four SLOs of Goal B.

All BSIT graduates are required to take the CTM exam. We put it as part of the IT 196 class requirements to guarantee the coverage.

Target: We want to make the overall “Pass rate” above 60%.

• **IT 199 Paper**: Direct Measure

All BSIT students are required to take “IT 199 – Senior Problem” in Industrial Technology. Students need to select a research topic in industrial technology based on their interests. Then they need to plan and write proposal and working procedures, conduct planned research to finish the project, and conclude the research work and write a final report (IT 199 paper). We can use this assignment to assess several SLOs: A.4 – Apply scientific and mathematical principles and practices to industrial applications, A.5 – Design industrial processes, systems and products, B.1 – Manage projects from planning to completion, D.1 – Develop research and problem-solving skills, D.2 – Propose, plan and execute independent projects incorporating various technical and managerial components, and D.3 – Present findings from technical and scientific research. Of course, this assignment will also reflect the assessment of SLOs A.1 ~ A.6 according to the specific topics of the projects.

The “Paper and Report rubric” we are using to evaluate this assessment is attached as Appendix A at the end of this report.

Target: Our target is to make 75% of the average scores above 3.5 out of 5. • **Exit survey**: Indirect Measure

All graduating BSIT seniors are required to take the exit survey. It is part of the IT 196 class requirements. There are 13 questions to cover the academic standards, quality of faculty, quality of students, appropriate of BSIT courses, advising, financial assistance, internship, and career services, etc. And 5 questions (Q14 ~ Q18) to ask about what level of knowledge students learned in technical (Goal A), management (Goal B), leadership (Goal C), research (Goal D), and communication (Goal E). The survey form is attached as Appendix B at the end of this report.

Target: Our target is to make 75% of the average scores above 3.5 out of 5.

3. What did you learn from your analysis of the data? Please include sample size (how many students were evaluated) and indicate how many students (number or percentage instead of a median or mean) were designated as proficient.

• **Standard exam** (ATMAE CTM exam): Direct Measure

On December 8, 2020, 20 students, and April 27, 2021, 16 students took the Certified Technology Manager (CTM) exam respectively. CTM exam is the standard certification exam administered by our national association – Association of Technology Management and Applied Engineering (ATMAE). It covers most of the management core courses required for our students.

The overall results indicated that our pass rate of 40% (8 students out of 20 passed) in the Fall 2020 semester is below our target pass rate of 60%, and 50% (8 students out of 16 passed) in the Spring 2021 semester is also lower than our target pass rate of 60%.



The CTM exam also reports the detailed individual results for the 10 categories Leadership, Self-management, Systems, Processes, Operations, People, Project, Quality, Risk, and Safety. Those 10 categories with 55 sub-categories are partly related to most of our management core courses required for all students. Taking the “Quality” category as example, we can look at the data for the Quality category with 6 sub-categories, Quality management, Sampling, Probability, Control chart, Reliability, and Statistics. This category is related to our management core course “IT 117 – Quality Assurance”. The related SLO is the Goal B (Management goal), SLO 2: “Be able to appraise and manage quality systems, including development and analysis of standard quality data.” We have sent the information to all faculty members, so they can find the weak points for their courses and improve their teaching.

We also found that ATMAE has changed the CTM exam a lot this year. They don’t report the national average pass rate anymore, which were used by us to compare our students’ learning outcomes to more than one hundred other universities nationwide. This change makes the CTM exam less valuable for our assessment. Faculty suggested we stop using CTM as our assessment tool in the future because of this big change.

**Standard Exam Conclusion**: We didn’t reach the target of making the overall “Pass rate” above 60% for both semesters of 2020-21 academic year. By looking at the detailed results, we can see that our students are making progress and getting closer to our target of 60% passing rate.

• **IT 199 Paper**: Direct Measure

“IT 199 – Senior Problem” is the core of our Bachelor of Industrial Technology program. Students need to apply the knowledges and skills they have learned to finish a research project individually under the directions of a faculty advisor. We are using this assignment to assess the SLOs: A.4 – Apply scientific and mathematical principles and practices to industrial applications, A.5 – Design industrial processes, systems and products, B.1 – Manage projects from planning to completion, D.1 – Develop research and problem-solving skills, D.2 – Propose, plan and execute independent projects incorporating various technical and managerial components, and D.3 – Present findings from technical and scientific research. Of course, this assignment will also reflect the assessment of SLOs A.1 ~ A.6 according to the specific topics of the projects.

In the 2020-21 academic year, we assessed 19 IT 199 papers using the “Paper and Report rubric” (See Appendix A). The papers are assessed in 11 aspects: Research principles, Hypothesis, Objective description, Support, Argument, Formulation, Problem solving, Independent thinking, Respect/value/integrity, Conclusion, and Reporting.

**1 2 3 4 5 6 7 8 9 10 11 12 13 14 15 16 17 18 19 Research principles** 4 4 3 3 5 4 5 5 5 5 4 3 4 3 4 4 3 3 3 **Hypothesis** 4 3 3 2 4 4 4 4 4 4 4 4 4 3 4 4 2 3 4 **Objective description** 5 5 3 3 4 5 4 4 4 4 5 4 5 3 4 5 4 4 4 **Support** 4 4 3 3 1 5 5 4 5 5 5 4 5 3 4 5 1 1 1 **Argument** 4 4 4 3 5 4 4 4 4 4 5 4 5 3 4 4 4 4 4 **Formulation** 4 5 3 3 5 3 2 3 3 3 4 4 5 4 5 3 4 4 4 **Problem solving** 4 4 3 3 5 5 2 2 3 3 5 4 5 4 5 5 4 4 4 **Independent thinking** 4 4 2 2 5 5 3 3 3 3 5 4 5 4 5 5 4 4 4 **Respect/Value/Integrity** 4 5 4 4 4 5 5 5 5 5 5 4 5 4 5 5 4 4 4 **Conclusion** 4 3 2 2 3 5 4 4 4 4 4 4 5 4 5 5 4 4 4 **Reporting** 4 4 3 3 3 5 3 4 3 3 4 4 4 4 5 5 3 3 3 4.09 4.09 3.00 2.82 4.00 4.55 3.73 3.82 3.91 3.91 4.55 3.91 4.73 3.55 4.55 4.55 3.36 3.45 3.55

From the results, we can see that among 19 students, 15 of them (78.94%) meet our target score of 3.5 out of 5. Four students (21.05%) didn’t meet our target score. Because our target is for 75% of the students to meet the target score, we meet the criterion for IT 199 papers.

**IT 199 Paper Conclusion:** We are above the target for the IT 199 paper assignment. Four out of 19 students got lower scores. Faculty member think that the paper rubric has been too old. Some items are not appropriate and need to be modified.

• **Exit survey**: Indirect Measure

Among the 19 survey questions, 13 questions cover the academic standards, quality of faculty, quality of students, appropriate of BSIT courses, advising, financial assistance, internship, and career services, etc. And 5 questions (Q14 ~ Q18) to ask about what level of knowledge students learned in technical – Goal A (Question 15), management – Goal

B (Question 14), leadership – Goal C (Question 17), research – Goal D (Question 16), and communication – Goal E (Question 18).



The Exit Survey results showed that in Fall 2020, all of the 20 participating students (100%) gave us overall scores above the 3.5 target:

**QuestionAns 1 2 3 4 5 6 7 8 9 10 11 12 13 14 15 16 17 18 19 20** 1 4 4 4 5 5 5 5 4 5 4 4 5 4 3 3 5 5 4 5 5 2 4 4 4 4 5 5 5 5 5 5 3 5 4 4 3 5 5 4 5 4 3 4 4 1 4 5 5 5 4 3 5 5 5 3 3 3 5 5 4 3 4 4 4 5 4 4 5 5 4 5 5 5 5 5 3 4 4 5 4 4 4 4 5 4 5 4 5 5 5 4 5 3 4 5 5 4 4 4 5 4 4 5 4 6 4 4 4 4 5 5 4 3 5 4 3 5 4 3 4 5 5 4 5 3 7 4 5 3 5 3 5 5 4 5 4 4 5 3 3 4 5 5 4 5 5 8 4 5 3 5 5 5 5 4 4 4 4 5 4 3 4 5 5 4 3 4 9 4 5 4 5 5 5 5 4 5 4 5 5 4 4 4 4 5 4 4 4 10 4 5 4 5 5 5 5 3 5 5 4 5 4 4 4 5 5 4 4 4 11 3 4 4 2 3 5 4 3 5 5 4 5 2 4 4 5 4 4 4 4 12 5 4 4 5 3 5 5 5 5 5 4 5 3 2 4 5 5 4 3 5 13 5 3 4 4 5 5 5 4 5 5 4 5 4 4 4 5 4 4 4 4 14 5 5 4 5 4 5 5 5 5 5 5 4 4 4 4 5 4 5 4 5 15 4 5 4 4 5 5 5 5 5 5 3 5 4 4 4 4 5 5 5 4 16 4 5 5 4 4 5 5 4 5 5 4 4 4 3 4 5 3 5 5 4 17 3 5 2 5 5 5 5 4 5 4 5 3 4 4 4 5 4 5 5 5 18 5 4 4 5 4 5 5 4 5 4 5 5 3 4 4 5 5 5 4 4 19 5 5 4 5 4 5 5 4 5 5 4 5 4 4 4 5 5 5 4 4 4.16 4.53 3.68 4.47 4.47 5.00 4.79 4.16 4.74 4.58 4.21 4.79 3.63 3.58 3.84 4.89 4.58 4.32 4.26 4.21

For the five program Goals: All students gave us scores above 3 for the Goal B – Management goal (Question 14). One student (5%) gave us a score below 4 for the Goal A – Technical goal (Question 15) and Goal E – Lifetime goal. Two students (10%) gave us scores below 4 for the Goal D – Research goal (Question 16). Three students (15%) gave us scores below 4 for the Goal C – Leadership goal (Question 17).

And in Spring 2021, 3 out of 20 students (15%) gave us overall scores lower than the 3.5 target (3.37, 3.47 and 3.21):

**QuestionAns 1 2 3 4 5 6 7 8 9 10 11 12 13 14 15 16 17 18 19 20** 1 5 5 5 5 4 5 4 3 3 5 5 4 2 3 4 4 4 3 4 2 2 5 4 5 5 4 5 4 2 4 5 5 5 3 4 4 4 5 4 5 3 3 5 5 4 5 5 5 5 1 2 4 5 5 3 4 4 4 4 4 3 5 4 5 5 5 5 4 5 5 5 2 5 5 4 3 5 4 4 5 3 3 4 5 5 5 5 5 5 5 4 4 3 5 5 4 3 5 4 4 4 4 4 4 6 5 5 5 5 4 5 4 3 1 5 5 4 3 4 4 5 3 3 3 5 7 5 5 5 5 5 5 5 3 5 5 5 5 5 5 5 3 4 3 4 3 8 5 5 5 5 5 5 4 3 4 5 5 5 3 4 5 4 5 4 5 5 9 5 5 5 5 4 5 4 4 3 5 5 5 3 2 4 4 5 4 3 4 10 5 5 5 5 5 5 4 2 5 5 5 5 3 5 5 3 5 4 5 3 11 4 4 5 5 5 5 5 3 4 5 5 4 3 3 5 4 5 3 5 3 12 5 5 5 5 5 3 5 5 5 5 5 5 4 5 5 4 5 5 5 3 13 5 5 5 5 5 5 4 5 5 5 5 5 4 5 5 4 5 3 5 3 14 5 5 4 5 4 5 4 4 4 5 5 5 5 4 5 3 4 4 4 3 15 5 5 5 5 4 5 4 3 3 5 5 5 4 4 5 4 5 4 4 3 16 5 5 5 5 3 4 4 4 4 5 5 4 2 5 5 4 5 4 4 4 17 5 4 4 4 4 5 5 4 1 3 5 4 3 3 4 3 3 5 3 3 18 5 5 4 4 4 5 5 3 4 5 5 5 3 3 5 3 4 5 4 4 19 5 5 5 5 5 5 4 3 4 5 5 5 2 4 5 4 5 5 5 4 4.95 4.84 4.79 4.89 4.42 4.84 4.37 3.37 3.47 4.84 5.00 4.63 3.21 4.05 4.58 3.79 4.47 3.89 4.11 3.58

For the five program Goals: Two students (10%) gave us scores below 4 for the Goal B – Management goal (Question 14) and Goal D – Research goal (Question 16). Three students (15%) gave us scores below 4 for the Goal A – Technical goal (Question 15). Four students (20%) gave us scores below 4 for the Goal E – Lifetime goal. Eight students (40%) gave us scores below 4 for the Goal C – Leadership goal (Question 17).

**Exit Survey Conclusion:** Overall, average scores for all 19 questions are high, which reflected that our students are generally satisfied with our program. For the five program Goals, the results showed that the only item with less than 75% of students giving us scores higher than 4.0 is the Goal C – Leadership goal (Question 17).

4. What changes, if any, do you recommend based on the assessment data?

All full-time Industrial Technology department faculty (and some part-time faculty as well) worked together to create and modify our SOAP, to create the measurement tools and maintain their quality over time, to collect data from the relevant teaching activities, and to discuss the assessment results after the data had been compiled and presented by the assessment coordinator.

**Standard Exam:** The CTM standard exam analysis report had been presented at our department meeting to let all faculty members understand the current status of our students and how far to our targets. Faculty members had a discussion on how to improve our students’ performance in CTM exams. Our pass rates were getting lower in previous semesters because for a specific group of international students, their performances are significantly lower. The principal reason is that they transferred to our department from another country with quite different curriculum. And there’s very little we can do to improve that situation. With a trend that the number of students in that specific group is going down, faculty members decide that no change will be made during this time.

In the 2020-21 academic year, we cannot use the CTM exam in a traditional way. After ATMAE changed the CTM exam report, there are no information about the performances of other universities. Therefore, we cannot compare our students’ performance with students from other universities, which is the most important reason we wanted to use CTM exam as our assessment tool.

In the 2020-21 academic year, faculty recommended the following changes for Standard exam based on the assessment data:

• Stop using ATMAE CTM exam as our assessment tool.

• Make a plan for assessing our management core courses. In the future, we will follow the plan to assess our management core courses one SLO per year in the future.

**IT 199 Paper:** We meet the target for the IT 199 paper assessment. Our faculty members are satisfied with the assessment results. Faculty members didn’t make any recommendations. But faculty members think that our rubric is not very good for assessing the IT 199 papers.

• In the 2020**-**21 academic year, faculty members recommended that we discuss and make a new IT 199 paper rubric.

**Exit Survey:** Faculty members are satisfied with the overall average scores for the 19 questions. But for the Goal C – Leadership goal (Question 17), we get 8 scores lower than 4.0. Faculty didn’t make any recommendations for this one-time event. Faculty members suggested we keep an eye on the Question 17 results in the future.

5. If you recommended any changes in your response to Question 4 in your 2018-19 assessment report, what progress have you made in implementing these changes? If you

did not recommend making any changes in last year’s report please write N/A as your answer to this question.

Last year, teaching assessment activities were suspended because of CVID-19 pandemic. There’s no annual assessment report for the 2019-20 academic year.

In the 2018-19 academic year, we did Standard Exam (Direct measure) and Exit Survey (Indirect measure):

**Standard Exam:** Faculty members found that for a specific group of international students, their performances are significantly lower. The principal reason is that those students transferred to our department from another country with quite different curriculum. And currently there’s very little we can do to improve this situation. Faculty members decide that **no change** will be made during that time.

With a trend that the number of students in that specific group is going down recently, we have found that our students’ performances in CTM exams were apparently improved.

**Exit Survey:** From the results of Exit Survey, we found that some students gave us low scores for Question 6 – “Intellectual quality of fellow students”, which reflected the same situation indicated above for CTM exams (a specific group of international students). And as mentioned above, there’s no solution at that time for this problem. So, faculty **didn’t suggest any recommendation**.

6. What assessment activities will you be conducting during AY 2021-22?

Based on our current SOAP, the following assessment activities will be conducted during the 2021-2022 academic year:

• **Exit survey**: Indirect Measure

We will continue to do the Exit Survey to assess the overall student learning outcomes for technical (Goal A), management (Goal B), leadership (Goal C), research (Goal D), and communication (Goal E).

All BSIT graduates will be required to take the Exit Survey. We put it as part of the IT 196 class requirements.

• **Exams**: Direct Measure

We will select a technical core course to assess one of the student learning outcomes for Goal A. All of the exams of the selected course will be analyzed, and all of the course learning outcomes will be examined.

7. Identify and discuss any major issues identified during your last Program Review and in what ways these issues have or have not been addressed.

Our last Program Review was finished in Spring 2016, and the two-year follow-up was done in Spring 2018.

In the 2020-21 academic year, we made the following progresses:

• Consolidate synergies and collaborations with community colleges The department has participated in the Building Pathways for Student Success initiative, a collaborative effort between Jordan College and community colleges to facilitate the success of transfer students to Jordan College. Additionally, the department has participated in the Ag Mechanics/Industrial Technology collaboration forum with community colleges.

• Continue recruiting for the MSc program

The program faced a challenge due to a decrease in the number of international students. This decrease was related to Covid 19, visas and other issues outside the department’s control. The number of graduate students in Spring 2021 stabilized to 20.

• Create synergies with Central Valley’s commodity groups

The department with the support of Ag One and the Deans office has initiated discussions with commodity groups to update its curriculum and equipment.

**Appendix A – Paper and Report Rubric**

|  |  |  |
| --- | --- | --- |
|  | Rating (1-5 scale), 5 is high  | **Student Rating** |
|  | High (5) Low (4)  | High (3) Low (2)  | 1  |
|  | Exceeds standards  | Meets standards  | Does not meet standards |
| Research principles | Direct and immediate application  | A feasible application, Student gained knowledge | Cannot see any application |  |
| Hypothesis  | Written clearly with assumption | Clearly written, no assumption | No hypothesis |  |
| Objective description | Motivated objective written clearly and precisely | Long paragraph without any focus  | Not clearly written |  |
| Support  | Literature review Chapter | Written somewhere in the report | Does not have any text |  |
| Argument  | There must be a chapter on Methodology | Written somewhere in the report | Does not have any text |  |
|  | Formulation Tables, Figures, Charts, etc. are appropriately cited and placed | Only text without supporting evidences | No attention |  |
| Problem solving | Implementation strategy, cost performance study | Only implementation strategy |  |  |
| Independent thinking | Did the survey, research, etc. alone | Took help of the technicians, assistants in getting the results | Did not do independently |  |
| Respect, Value, Integrity | Citations are properly mentioned, permissions on tables, figures, etc., have been properly obtained | Permissions on tables, figures, charts, etc. have been obtained.  | Citations are not properly mentioned, permissions on tables, figures, etc, have not been properly obtained |  |
| Conclusion  | The report has a separate chapter and concluding remarks are appropriate | The report has concluding remarks | Concluding remarks are not made |  |
| Reporting  | Complete with at least 4 separate chapters with Introduction, Literature review, Methodology, Results, Conclusion and Future work | Some chapters are missing and included in other parts of the report | One chapter reporting |  |

**Appendix B – Exit Survey Form**

|  |  |
| --- | --- |
|  | Rating (1-5) (5 is high) |
| (5)  | (4)  | (3)  | (2)  | (1) |
| Academic rigor of the program |  |  |  |  |  |
| Integration of current technical developments in the field |  |  |  |  |  |
| Program space and facility (classrooms, labs, and equipment) |  |  |  |  |  |
| Interaction between faculty and students |  |  |  |  |  |
| Overall quality of faculty |  |  |  |  |  |
| Intellectual quality of fellow students (peer students’ abilities, enthusiasm, and cooperation) |  |  |  |  |  |
| Quality of program advising |  |  |  |  |  |
| Amount of coursework seems appropriate for the BS degree |  |  |  |  |  |
| Amount of course work seems consistent across department faculty |  |  |  |  |  |
| Interdisciplinary technological knowledge |  |  |  |  |  |
| Financial assistance opportunities |  |  |  |  |  |
| Internship opportunities |  |  |  |  |  |
| Career Services |  |  |  |  |  |
| ***What level of knowledge did you gain in the following areas?***  |
| Management knowledge |  |  |  |  |  |
| Technical knowledge |  |  |  |  |  |
| Research knowledge (Including Senior project IT 199) |  |  |  |  |  |
| Leadership knowledge (Including student clubs) |  |  |  |  |  |
| Communication knowledge (Including IT 198W) |  |  |  |  |  |
| Program content fits well to your career goal |  |  |  |  |  |