ASSESSMENT COVER SHEET AND CHECKLIST FOR 2021-2022 REPORTING PERIOD

DUE OCTOBER 1, 2022 (*OR THEREABOUTS*)

1. Academic Program, Office, or General Ed. Area: Information Technology.

2. Report completed by (include title): Clinton Jeffery, Chair of CSE.

3. Date(s) assessment results discussed with faculty/staff: Email 1/19/23.

Self-Review Checklist

Yes	No	N/A	
X			Are student learning outcomes (SLOs) clearly stated? (*What students should know or be able to do*.)
X			Is a curricular map included? (Mandatory for undergrad. programs.)
		X	Are the checklists for online courses included?
X			Are rubrics being used by the department included (or at least a representative rubric)? (recommended, not required)
X			Are assessment methods / measures noted for all outcomes? (*How you will assess student performance on the outcomes*.)
X			Are results included and discussed?
X			Have follow-up actions been identified that are based on the results/information collected? (*How are the results being used to improve student learning and meeting a particular SLO?*)
	X		Was there any follow-up from previous feedback (*e.g., dept. discussion of feedback; changes to the plan, actions*)?

Please contact Michael Jackson if you have any questions when completing your report. michael.jackson@nmt.edu, 575-835-5311.

2021-2022 Assessment Report for Department: *CSE*

General Education Core Curriculum Area:

Undergraduate Major: *Information Technology*

Department Mission Statement:
The mission of the B.S in Information Technology Program is to produce graduates who, trained in problem solving, programming, networking, computer security, database, technical communication, and business processes, are able to design, implement, and configure information technology systems to meet organizational needs.

Program Outcomes (*a.k.a.* **Student Outcomes)**:

At graduation, students should have

1) [software development] the ability to design, implement, test, and configure software programs;
2) [project management] the ability to analyze information technology requirements, assess risk, optimize resources, monitor and evaluate progress, and manage project budgets;
3) [system/theory] knowledge of the fundamental principles of information processing and decision, networking, security, and database;
4) [application] exposure to one or more information technology areas;
5) [technical communication] technical communication skills in written and oral forms;
6) [team work] the capacity to work as part of a team;
7) [ethics] awareness of the legal, ethical and societal impact of developments in the field of information technology;
8) [business] developing a business case for an organizational decision to pursue an IT project.

Curricular Map*:*

Each numeric entry (between 1 and 3) represents the relative weight of a course (row) towards a program outcome (column).

		Program Outcome							
Course	Course Title	1. Software Development	2. Project Management	3. System/ Theory	4. Applications	5. Tech. Comm.	6. Team work	7. Ethics	8. Business
IT101	Intro to Comp Science & Info Tech	**2**			**2**				
IT113	Intro to Comp Science & Programming	**3**							
IT122	Algorithms & Data Structures	**3**							
IT213	Introduction to Object-oriented Programming	**3**							
IT221	Computer Systems Organization			**3**					
CS222	Systems Programming			**3**					
CS241	Foundations of Computer Science			**3**					
IT263	Information Protection and Security			**3**					
IT321	Internet and Web Programming			**2**	**3**				
IT326	Software Engineering	**3**				**3**	**3**		
IT330	Management and Organization Behavior						**3**		**3**
IT353	Introduction to Computer Networks			**3**					
IT373	Introduction to Database Design and Management			**3**	**2**				
IT382	Legal, Ethical, and Social Issues of IT							**3**	
IT462	Systems, Risk and Decision Analysis								**3**
IT466	Project Management		**3**						**3**
IT481-IT 482	Senior Secure System Design Project		**3**	**3**		**2**			**2**

Our process target:

For Information Technology we intend to eventually implement a process like that used for the (much larger) Computer Science program, described here. For this report, a simplified process is used, described in the next section.

- The above curricular map was obtained by first considering all courses and assigning weights between 1 and 3 (inclusive) to reflect the strength of their contribution, with the following interpretation.

Contribution	*Interpretation*
1	Introductory / preliminary
2	Reinforcement / extension / application
3	Major component

Next, it was pruned keeping only the required courses, and then pruning it further by eliminating weights of 1 and 2 unless one of three criteria (omitted here) were met.

- For each Program (/Student) Outcome, we obtain a number between 1 and 4 through a weighted sum of scores from contributing courses as per the curricular map shown above. Our acceptance threshold for each program outcome is 3.0.
- The scores from contributing courses come from the respective instructors who are required to submit an assessment report for each offering of such courses. This report outlines the relation between the scores and the course learning outcomes.
- The report also provides comments regarding successful strategies and plans for future modifications. While we have a numeric acceptance threshold, the instructors' comments are always important.
- The numeric score for the j^{th} Program Outcome is a normalized weighted sum

$$Score\_Outcome_j = \frac{\sum_i (n_{ij} * s_{ij})}{\sum_i n_{ij}}$$

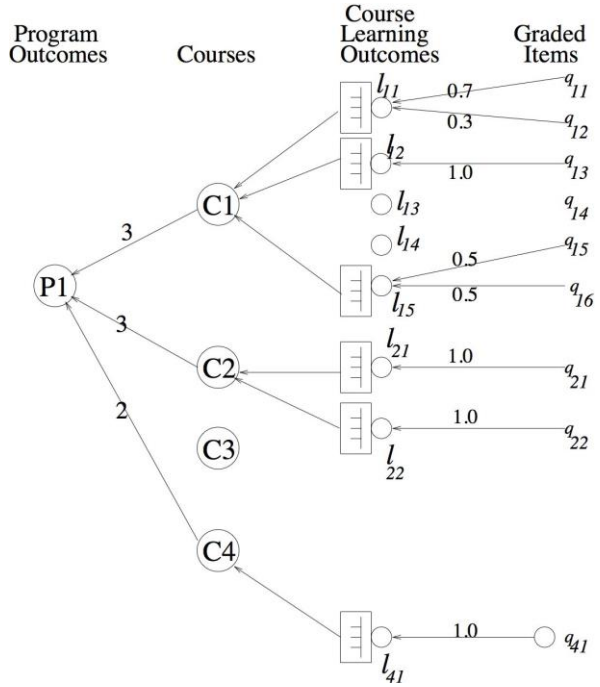
where the weights n_{ij} are the non-zero entries in the column for Program Outcome j in the curricular map, and each value s_{ij} is a score that comes from the assessment of the i^{th} course specifically for the j^{th} Program Outcome. For example, the curricular map shows that Program Outcome 5 (Technical Communication) will be measured using three courses CS326 Software Engineering, CS423 Compiler Writing, and CS331 Computer Architecture, with impact factors of 3, 3, and 2 respectively. If the numeric scores assessed by those three courses are 3, 2, and 4 respectively, then the score computed for Student Outcome 5 is given by (3*3 + 2*3 + 4*2)/(3+3+2), i.e., 2.88.

We limit the score s_{ij} (reported by a course i for a Student Outcome j) to a number between 1 and 4 with the following

interpretation.

Student Outcome score	*Interpretation*	
1	Unsatisfactory	
2	Marginal	
3	Satisfactory	
4	Excellent	

- The instructor of the i^{th} course computes a score s_{ij} for the j^{th} Program Outcome as follows.



The first step is to identify the largest disjoint set *L* of course learning outcomes corresponding to the Program Outcome at hand at hand. For that set *L*,

	1. The instructor decides on a performance metric to interpret an average score for a course outcome as unsatisfactory, marginal, satisfactory, or excellent, resulting in the basis for a four-point scale; this takes care of variations among courses in grading, e.g., relative versus absolute, partial credit versus all-or-none grading. 2. Each course outcome *l* in *L* is tied to a set of gradable items in the course, e.g., a project, specific questions in the final exam, a presentation, etc. The sets of items should be disjoint among learning outcomes. In the above figure, course outcome l_{11} would be tied to questions q_{11} and q_{12}. 3. Weights are assigned to these questions or items (in Figure 1, 0.7 and 0.3 for questions q_{11} and q_{12} respectively); using them, a formula is written to compute a normalized weighted sum from the scores for those questions or items; 4. From a table of scores obtained by the students on those gradable items, one numeric score is computed for each student per course outcome *l*. 5. Those numeric scores are then averaged over the whole class to get one numeric score p_l for each course outcome *l.* 6. Using the performance metric, a number q_l is obtained by quantizing p_l to a four-point scale. 7. The above is repeated for each *l* in *L.* 8. The scores q_l (in the four-point scale) are averaged over all *l* in *L.* The result is $s_{ij,}$ the numeric score (between 1 and 4) from course *i* to the Student Outcome *j*. Due to the low enrollment number for the B.S. in Information Technology, we perform the above-mentioned assessment by using the data compiled for 3 years. This report thus presents available data for three years.
	Our process in this report: Assessment of the IT program continues to face many hurdles. Almost all IT courses are taught and assessed primarily as a CSE course or an MGT course, and it is difficult for instructors to pick out IT students. When available, IT-specific data will be provided and when not, class-wide assessment data will be used. In a span of years necessary for any amount of anonymization or statistical validity, faculty may depart. Other faculty for some of these courses are adjuncts and not NMT employees. Additional communication about assessment requirements is needed, such as stipulating the assessment specifics in future instructor contracts. Where possible, the chair is moving collection of assessment data to courses taught by full-time NMT faculty. Collecting and retaining data from several years ago can pose additional challenges. For these reasons, we are working on changing from performing the assessment every three years to instead perform assessments annually over a rolling three-year basis, thus always providing two years' data for the next assessment so it only needs to incorporate one year of new data. In 2020, the chair received AVPAA approval for a streamlined process as follows. Due to redundancy of assessment implied by the assessment map, each program outcome was assessed in a designated best course for assessing that outcome. This plan was slightly revised for 2021-2022 as follows:

	Software Development: best assessed in IT 326 Software Engineering Project Management: best assessed in IT 481-482 Senior Design Project System/Theory: best assessed in IT 373 Intro to Database Systems Applications: best assessed in IT 321 Internet and Web Programming Technical Communication: best assessed in IT 326 Software Engineering Team Work: best assessed in IT 326 Software Engineering Ethics: best assessed in IT 382 Legal Ethical and Social Issues of Tech Business: best assessed in IT 462 Systems and Risk

Enrollment Data

Due to the low enrollment for the B.S. in Information Technology program, we present the BS in IT assessment data for three years, starting Fall 2019. The table below shows *enrollment* data accumulated for three years. Even aggregating over three years, the enrollments are low enough that statistical significance may be doubted at times. *Some CSE or MGT courses might inadvertently have no IT section created in some semesters. It is common for IT students to take the course via CSE or MGT or some other prefix and apply it to their IT degree by petition. Similarly, when CS sections fill up, CS students sometimes have enrolled in the IT section of a course. This may affect enrollment data. Due to instructor availability and a scheduling change, IT 466 was not offered in F20 or S21.

Course	Course Title	Fall19	Spring20	Fall20	Spring21	Fall21	Spring22
IT101	Intro to Comp Science & Info Tech	5		4		0	0
IT113	Intro to Comp Science & Programming	4	1		0	0	1
IT122	Algorithms & Data Structures	0	1	1	1	0	2
IT213	Introduction to Object-oriented Programming		3		2		1
IT221	Computer Systems Organization	3		3		2	
CS222	Systems Programming						
CS241	Foundations of Computer Science						
IT263	Information Protection and Security	10					
IT321	Internet and Web Programming	2		4		0	
IT326	Software Engineering		2		5		0
IT330	Management and Organization Behavior						
IT353	Introduction to Computer Networks			4		0	

IT363	Computer Security						1
IT373	Introduction to Database Systems		3		4		4
IT382	Legal, Ethical, and Social Issues of Information Technology		3		2		4
IT462	Systems, Risk and Decision Analysis		2*		2		
IT466	Project Management	2					4
IT481	Senior Secure System Design Project	3		3		4	
IT482	Senior Secure System Design Project		3		3		3

Assessment

Due to the low enrollment for the B.S. in Information Technology program, we present the BS in IT assessment data for three years, starting Fall 2019, and conduct the above-mentioned assessment by using the data compiled for 3 years. The table below shows *outcomes* data accumulated for three years.

#1 the ability to design, implement, test, and configure software programs

<table>
<tr><th>Student Learning Outcomes</th><th>Assessment Procedures</th><th>Assessment Results</th><th>Assurance</th></tr>
<tr><td>Learning Outcomes of the Program—Students will be able to:</td><td>Process/Instrument used:
Direct measures. Graded items are weighted and linked to courses; courses are weighted, aggregated, and linked to student outcomes.</td><td>What were your findings?
Score range: 1 (unsatisfactory),
2 (marginal),
3 (satisfactory), and
4 (excellent).</td><td>Our department believes we fulfill this Learning Outcome because:
(state evidence in 30 words or less)</td></tr>
<tr><td>1. Design, implement, test and configure software programs</td><td>Direct Measure:

Quantitative Assessment Procedure on Course Learning Outcomes 3-4 in IT 326. There were no IT 326 students in Spring 2022.</td><td>
<table>
<tr><th>Course</th><th>Score</th><th>Weight</th><th>Overall</th></tr>
<tr><td>IT326 Software Eng</td><td></td><td></td><td rowspan="3">3</td></tr>
<tr><td>IT326 2020-22 LO3</td><td>3</td><td>3</td></tr>
<tr><td>IT326 2020-22 LO4</td><td>3</td><td>3</td></tr>
</table>
</td><td>the overall scores for outcomes 3 and 4 are higher than 3.0, our acceptance threshold.</td></tr>
</table>

Adjustment/Improvement
The total number of IT major undergraduate students who took IT 326 Software Engineering during the period is seven: two in Spring 2020, five in Spring 2021, and none in Spring 2022. Due to data inconsistency caused by some course design decisions due to Covid19, the assessment was based on only the final exam and final team-based project. For instance, the second midterm in Spring 2020 was cancelled due to Covid19. The overall assessment result for IT 326 is similar to that of CSE 326 Software Engineering. Students' understanding of requirements engineering and software design are satisfactory but has room for improvement. At the level of raw scores, the three-year rolling average for learning outcomes 3 and 4 are slightly increased in 2019-2021 compared with 2018-2020.

#2 the ability to analyze information technology requirements, assess risk, optimize resources, monitor and evaluate progress, and manage project budgets

In the F20/S21 school year, IT 466 was not taught, so the outcome assessment was switched to using data from IT 481/482.

Student Learning Outcomes	Assessment Procedures	Assessment Results	Assurance
Learning Outcomes of the Program—Students will be able to:	Process/Instrument used: IT 466 direct measures. Graded items are weighted and linked to courses; courses are weighted, aggregated, and linked to student outcomes. Covered Fall 2018 and Fall 2019. IT 481-482 direct measures: Project plan with major tasks, timelines, method, and outcomes. Final report section discusses actual enactment of plan.	What were your findings? Score range: 1 (unsatisfactory), 2 (marginal), 3 (satisfactory), and 4 (excellent).	Our department believes we fulfill this Learning Outcome because: (state evidence in 30 words or less)

<table>
<tr>
<td>2. Analyze information technology requirements, assess risk, optimize resources, monitor and evaluate progress, and manage project budgets.</td>
<td>Direct Measure:

Quantitative Assessment Procedure on all 9 course outcomes for combined IT466+MGT476+EMGT508.</td>
<td>
<table>
<tr><th>Course</th><th>Score</th><th>Weight</th><th>Overall</th></tr>
<tr><td>IT466 F2019:</td><td>3</td><td>3</td><td rowspan="3">3.3</td></tr>
<tr><td>IT466 F2020:</td><td>4</td><td>3</td></tr>
<tr><td>IT481-2: 2019-21</td><td>3</td><td>3</td></tr>
</table>
</td>
<td>the overall scores for both Student outcome 1 is higher than 3.0, our acceptance threshold.</td>
</tr>
</table>

Adjustment/Improvement
The chair has determined that assessment in 481-482 was more informative than assessment in IT 466 done in prior years. He proposes to assess outcome #2 using IT 481/482 going forward.
Areas for future improvement of future offerings of IT 481/482: • Review the construction of a business case. Use a case study with a homework assignment. • Identify the individual interests and deficiencies of the students at the beginning of IT 481. Offer readings on IT project management with a follow-up assignment. • Review the use of statistics in IT projects.

#3 knowledge of the fundamental principles of information processing and decision, networking, security, and database

Student Learning Outcomes	**Assessment Procedures**	**Assessment Results**	**Assurance**
Learning Outcomes of the Program—Students will be able to:	Process/Instrument used: Direct measures. Graded items are weighted and linked to courses; courses are weighted, aggregated, and linked to student outcomes.	What were your findings? Score range: 1 (unsatisfactory), 2 (marginal), 3 (satisfactory), and 4 (excellent).	Our department believes we fulfill this Learning Outcome because: (state evidence in 30 words or less)

<table>
<tr>
<td>3. Show knowledge of the fundamental principles of information processing and decision, networking, security and database</td>
<td>Direct Measure:

Quantitative Assessment Procedure on Course Learning Outcomes 1 and 2 in IT 373 Database Mgt.</td>
<td>
<table>
<tr><th>Course</th><th>Score</th><th>Weight</th><th>Overall</th></tr>
<tr><td>IT373 S2020 LO1-2</td><td>3</td><td>3x3</td><td rowspan="3">1.8</td></tr>
<tr><td>IT373 S2021 LO1-2</td><td>1.5</td><td>3x3</td></tr>
<tr><td>IT373 S2022 LO1-2</td><td>1</td><td>3x4</td></tr>
</table>
</td>
<td>the overall scores for both outcomes is below 3.0, our acceptance threshold.</td>
</tr>
</table>

Adjustment/Improvement

- 2021-22 were impacted by the zoom format adopted as part of Covid response.
- The primary reason for the Unsatisfactory category appears to be participation volatility. Out of four students, two were no-shows in the final exam; this had a strong impact since most of the assessment is based on that exam. One did not do the project at all, one attempted less than half, while another lost most of the points for the first part owing to very late submission.
- In the past, it had helped when I split the project deliverables into two parts with different deadlines. Clearly, it has not worked in the last two years.
- Recently, it appears that several IT students (and they are few in number) are weak in the basic programming they had learned in their freshman courses.
- While this is a required course for IT students and an elective for CS students, the CS students performed much better than the IT students (overall: Satisfactory).
- I remain hopeful that the steep decline of the last two years will be reversed as the disruption caused by the pandemic eases.
- In recent years, the course was enhanced with non-relational databases: document oriented MongoDB (in 2020) and graph-based Neo4J (in 2021). These were received favorably and students did well in them.
- In the next offering, I shall attempt to provide live demos of sessions on the Oracle database management system and more encouragement to practice taking the mock exam I post before looking at the solutions.

#4 exposure to one or more information technology areas

<table>
<tr><th>Student Learning Outcomes</th><th>Assessment Procedures</th><th>Assessment Results</th><th>Assurance</th></tr>
<tr><td>Learning Outcomes of the Program—Students should have:</td><td>Process/Instrument used:
Direct measures. Graded items are weighted and linked to courses; courses are weighted, aggregated, and linked to student outcomes.</td><td>What were your findings?
Score range: 1 (unsatisfactory),
2 (marginal),
3 (satisfactory), and
4 (excellent).</td><td>Our department believes we fulfill this Learning Outcome because:
(state evidence in 30 words or less)</td></tr>
<tr><td>4. Exposure to one or more information technology areas</td><td>Direct Measure:

Quantitative Assessment Procedure on Course Outcome #2 for IT321.</td><td>
<table>
<tr><th>Course</th><th>Score</th><th>Weight</th><th>Overall</th></tr>
<tr><td>IT321 Internet and Web Programming</td><td></td><td></td><td rowspan="4">3</td></tr>
<tr><td>IT 321 Fall 2019</td><td>3</td><td>3</td></tr>
<tr><td>IT 321 Fall 2020</td><td>3</td><td>3</td></tr>
<tr><td>IT 321 Fall 2021</td><td>n/a</td><td>3</td></tr>
</table>
</td><td>the overall scores for outcome 2 is 3.0, our acceptance threshold.</td></tr>
</table>

Adjustment/Improvement
Fall 2019: Students should send the git report showing their contribution in the final project. It makes the grade reflect how much effort they spent on the project. The pre-requisite of CSE 321 is CSE 213 – Introduction to Object Oriented Programming. However, the credits can be earned by the Advanced Placement Program (Computer Science A). One of the students in the class is a freshman without solid training in CSE 113 and CSE 122 but is able to take this class with the AP credit. His performance is not well and make his team member spend more efforts in the project. To make sure the students will have similar ability in the class, the instructor will add CSE 122 as the pre-requisite of the course to prevent freshmen taking this class without required knowledge. Fall 2020: Reflecting the issue happened in the previous year, CSE 122 was added as the pre-requisite of the course to prevent freshmen taking this class without required knowledge. To conquer the coronavirus pandemic, the class is moved fully online this year. The instructor used *flipped classroom* to deliver the content. Students had to watched the lecture videos at home before the class hour began. They took quizzes in the beginning of the class, which is used in the assessment this time. The instructor explained the questions in the quizzes after students finished the quizzes and described the requirements of the assignments. Some issues happened in this semester. First of all, the new Java version was inconsistent with the old web server. The instructors will

test the environment to give new instructions regarding how to setup the proper development environment. The second one is students have trouble when they first work on HW5 – using AJAX to retrieve a data generated by the servlet from the database. The instructor will separate this assignment into three parts so students have time to work on the individual concepts one by one.

There were no students in IT 321 in Fall 2021.

#5 technical communication skills in written and oral forms

<table>
<tr><th>Student Learning Outcomes</th><th>Assessment Procedures</th><th>Assessment Results</th><th>Assurance</th></tr>
<tr><td>Learning Outcomes of the Program—Students should have:</td><td>Process/Instrument used:
Direct measures. Graded items are weighted and linked to courses; courses are weighted, aggregated, and linked to student outcomes. Covered Fall 2019, and Spring 2020.</td><td>What were your findings?
Score range: 1 (unsatisfactory),
2 (marginal),
3 (satisfactory), and
4 (excellent).</td><td>Our department believes we fulfill this Learning Outcome because:
(state evidence in 30 words or less)</td></tr>
<tr><td>5. Technical communication skills in written and oral forms</td><td>Direct Measure:

Quantitative Assessment Procedure on Course Learning Outcomes 2 and 6 in IT 326.</td><td>
<table>
<tr><th>Course</th><th>Score</th><th>Weight</th><th>Overall</th></tr>
<tr><td>IT 326 Software Eng</td><td></td><td></td><td rowspan="3">3.5</td></tr>
<tr><td>IT326 2020-22 LO2</td><td>3</td><td>3</td></tr>
<tr><td>IT326 2020-22 LO6</td><td>4</td><td>3</td></tr>
</table>
</td><td>the overall scores for both Student outcome 1
is higher than 3.0, our acceptance threshold.</td></tr>
</table>

Adjustment/Improvement
The three-year rolling average for learning outcome #2 was unchanged between 2019-2021 and 2020-2022. The three-year rolling average for learning outcome #6 was improved between 2019-2021 and 2020-2022.

#6 the capacity to work as part of a team

<table>
<tr><th>Student Learning Outcomes</th><th>Assessment Procedures</th><th>Assessment Results</th><th>Assurance</th></tr>
<tr><td>Learning Outcomes of the Program—Students should have:</td><td>Process/Instrument used:
Direct measures. Graded items are weighted and linked to courses; courses are weighted, aggregated, and linked to student outcomes. Covered Spring 2020-2022.</td><td>What were your findings?
Score range: 1 (unsatisfactory),
2 (marginal),
3 (satisfactory), and
4 (excellent).</td><td>Our department believes we fulfill this Learning Outcome because:
(state evidence in 30 words or less)</td></tr>
<tr><td>6. The capacity to work as part of a team.</td><td>Direct Measure:

Quantitative Assessment Procedure on Course Learning Outcome 7 in IT 326.</td><td><table><tr><th>Course</th><th>Score</th><th>Weight</th><th>Overall</th></tr><tr><td>IT 326 Software Eng</td><td></td><td></td><td rowspan="2">4</td></tr><tr><td>IT326 2020-22 LO7</td><td>4</td><td>3</td></tr></table></td><td>the overall scores for both Student outcome 1
is higher than 3.0, our acceptance threshold.</td></tr>
</table>

Adjustment/Improvement
The three year rolling average for learning outcome #7 was slightly improved between 2018-2020 and 2019-2021.

#7 awareness of the legal, ethical and societal impact of developments in the field of information technology

<table>
<tr><th>Student Learning Outcomes</th><th>Assessment Procedures</th><th>Assessment Results</th><th>Assurance</th></tr>
<tr><td>Learning Outcomes of the Program—Students should have:</td><td>Process/Instrument used:
Direct measures. Graded items are weighted and linked to courses; courses are weighted, aggregated, and linked to student outcomes.</td><td>What were your findings?
Score range: 1 (unsatisfactory),
2 (marginal),
3 (satisfactory), and
4 (excellent).</td><td>Our department believes we fulfill this Learning Outcome because:
(state evidence in 30 words or less)</td></tr>
<tr><td>7. Awareness of the legal, ethical and societal impact of developments in the field of information technology.</td><td>Direct Measure:

Quantitative Assessment Procedure on Course Learning Outcomes (1) and (4) on IT 382, Legal Ethical and Social Issues of Computing</td><td>
<table>
<tr><th>Course</th><th>Score</th><th>Weight</th><th>Overall</th></tr>
<tr><td>IT 382 Spring 20</td><td>3</td><td>3</td><td rowspan="3">3.2</td></tr>
<tr><td>IT 382 Spring 21</td><td>3</td><td>3</td></tr>
<tr><td>IT 382 Spring 22</td><td>3.55</td><td>3</td></tr>
</table>
</td><td>the overall scores for both Student outcome 1
is higher than 3.0, our acceptance threshold.</td></tr>
</table>

Adjustment/Improvement
I plan to offer a new workshop on “ethics research” where I provide more instruction on empirical/non-empirical claims, popular/scholarly research, and citation practices in ethics. I plan to provide more instruction (~20 minutes) on design practices and other ways of creating engaging multimedia.

#8 developing a business case for an organizational decision to pursue an IT project

<table>
<tr><th>Student Learning Outcomes</th><th>Assessment Procedures</th><th>Assessment Results</th><th>Assurance</th></tr>
<tr><td>Learning Outcomes of the Program—Students should have:</td><td>Process/Instrument used:
Direct measures. Graded items are weighted and linked to courses; courses are weighted, aggregated, and linked to student outcomes. Covers Spring 2020-2021 and Summer 2022.</td><td>What were your findings?
Score range: 1 (unsatisfactory),
2 (marginal),
3 (satisfactory), and
4 (excellent).</td><td>Our department believes we fulfill this Learning Outcome because:
(state evidence in 30 words or less)</td></tr>
<tr><td>8. Ability to develop a business case for an organizational decision to pursue an IT project.</td><td>Direct Measure:

Quantitative Assessment Procedure on Course Learning Outcomes (5) and (6) in IT 462.</td><td>
<table>
<tr><th>Course</th><th>Score</th><th>Weight</th><th>Overall</th></tr>
<tr><td>IT 462 Systems and Risk</td><td></td><td></td><td rowspan="3">2.5</td></tr>
<tr><td>IT462 Outcome 5</td><td>3</td><td>3</td></tr>
<tr><td>IT462 Outcome 6</td><td>2</td><td>3</td></tr>
</table>
</td><td>the overall scores for both Student outcome 1
is below 3.0, our acceptance threshold.</td></tr>
</table>

Adjustment/Improvement
Most IT majors enrolled in the class (offered simultaneously under other MGT/EMGT course titles) do not have adequate statistics & probability preparations to learn well in the quantitative modules of the course. The IT program should review statistics background required for the program versus the statistics background expected in this course and adjust requirements or course prerequisites.
Chair observes that MGT course outcomes are being assessed on a different scale than CSE which needs review. For example, qualitative interpretations such as "Good" or "Average" are given instead of CSE's 4-point scale from unsatisfactory to excellent. The chair also notes that the numbers of students reported for these assessments are so low as to make interpretation of statistics questionable.

Concluding Comments:

From the available collected data, the IT program outcomes are being delivered satisfactorily overall. Outcome 3 is an apparent conspicuous exception where attention is needed; however, the statistical validity of the sample size is dubious. The chair will discuss with faculty whether changes in the relevant course (IT 373) is needed, as well as whether the outcome should be assessed in

additional courses in order to add somewhat to the statistical validity. Another area where additional attention may be warranted is outcome 8. Management faculty will be consulted on whether this outcome needs additional representation in the curriculum, or better assessment, or both. Given the low number of students in the program, qualitative assessment methods may also be useful or needed.

The faculty continue to deliberate on questions of how to grow the IT program, and at the same time, it is a perpetual distraction and a bit of a guilt-trip, where we periodically bring up how the IT program never gets enough attention and faculty effort, without bothering to point out the catch-22 that 90+% of our customers are CS and we are already spread thin. The chair's opinion is that the IT program should acquire one or more special foci that distinguish it, perhaps system administration for example.

The chair's understanding of the IT program is primarily qualitative. The NMT IT program is more technical and more difficult than is typical for IT at other universities. Because the public perception of IT is that it is mostly vocational-technical school trade, our program could benefit from additional attention and branding – possibly even renaming. Another item that was discussed is whether the IT program should offer a BA degree. Thusfar we have not seen a way to lower the math requirements of the degree without compromising the program (or more crucially, the CS program), but the chair remains convinced that a high quality IT program does not intrinsically depend on calculus. The answer would be one or more, more targeted Math-for-IT course(s).

Submitted by: Clinton Jeffery Department Chair: Dr. Clinton Jeffery Date: 1/31/2023

Reviewed by Assessment Director/Director Signature: Date:
Comments:

Reviewed by Faculty Senate Assessment Committee/Committee Chair Signature: Date:
Comments:

Reviewed by Associate VP of Academic Affairs/AVPAA Signature: Date:
Comments:

Submitted to Vice President of Academic Affairs/Date: (no later than 9/15)