

Information Systems Program  
Evidence of Student Learning  
Use of Evidence of Student Learning  
2020-21

## Information Systems Program Learning Outcomes

1. Students will be able to write correct and robust software.
2. Students will analyze the interaction between hardware and software.
3. Students will demonstrate general knowledge of theories and practices in the core areas of business.
4. Students will critically analyze and apply business knowledge to solve complex business situations.
5. Students will be able to apply their technical knowledge and critical thinking to solve problems.
6. Students will demonstrate effective business communication through both written and verbal means.
  - *Students will be able to speak about their work with precision, clarity and organization.*
  - *Students will be able to write about their work with precision, clarity and organization.*
  - *Students will be able to identify, locate, evaluate, and effectively and responsibly use and cite information for the task at hand.*
7. Students will collaborate effectively in teams.
8. Students will be able to understand and create arguments supported by quantitative evidence.
9. Students will formulate business decisions informed by ethical attitudes and values.
10. Students will understand the professional, ethical and social issues and responsibilities with the implementation and use of technology.
11. Graduates will be prepared for careers that use information systems in business, industry, government and the non-profit sector; and graduate study in fields related to information systems.

## Assessment Data Mathematical, Information and Computer Sciences

**Learning Outcome:** Students will be able to write correct and robust software.

**Outcome Measure:** Annual: CSC2054 Signature Assignment. This assessment will switch to being in CSC2052 which is the first half of CSC2054. This will enable us to capture this outcome for mathematics and data science majors.

**Criteria for Success:** 80% of the students should have an average score of at least 2 in each of the major areas.

**Aligned with DQP Learning Areas (circle one or more):**

1. Specialized Knowledge
2. Broad Integrative Knowledge
3. Intellectual Skills/Core Competencies
4. Applied and Collaborative Learning, and
5. Civic and Global Learning

**Longitudinal Data:**

	Percentage of Class at 2 or Higher								
	2012	2013	2014	2015	2016	2017	2018	2019*	2020**
Compilation	100%	92%	75%	100%	94%	90%	75%		
Runtime Correctness	58%	85%	100%	62%	72%	95%	60%	45%	42%
Problem Solving	100%	100%	75%	92%	83%	80%	85%	70%	78%

\*Note that the instrument was changed in 2019.

\*\*Note that 2020 was a fully remotes semester due to COVID.

**Conclusions Drawn from Data:** The students find the run-time correctness the most challenging. This is because this is the area of programming that is the most detail oriented. The instrument was changed in 2019, the “compilation” test was removed because the rest of the work can not be evaluated if the program does not compile.

**Changes to be Made Based on Data:** Continue to emphasize the need to carefully de-bug computer code during development. The rubric was modified to clarify the definition of run-time correctness which has made scoring simpler (Fall 2017). We are continuing to work with students on the detail work needed for accurate computer programs.

### CSC 2054 Signature Assignment

	<b>Unsatisfactory (1)</b>	<b>Satisfactory (2)</b>	<b>Good (3)</b>	<b>Excellent (4)</b>
<b>Runtime Correctness</b>	<ul style="list-style-type: none"><li>• Less than 60% correct</li></ul>	<ul style="list-style-type: none"><li>• Between 60% – 79% correctness</li></ul>	<ul style="list-style-type: none"><li>• 80% - 89%</li></ul>	<ul style="list-style-type: none"><li>• 90% – 100%</li></ul>
<b>Problem Solving</b>	<ul style="list-style-type: none"><li>• Analysis of program source code indicates that program is NOT close to working, and could NOT easily be modified to work given additional time.</li></ul>	<ul style="list-style-type: none"><li>• Analysis of program source code indicates that the student partially understands the problem solution or understands the solution but could not efficiently translate the solution to C++ code.</li></ul>	<ul style="list-style-type: none"><li>• Analysis of program source code indicates that program is close to working, and could be modified to work given additional time.</li></ul>	<ul style="list-style-type: none"><li>• All tasks execute correctly indicating that the code is both correct and robust (can catch user input errors).</li></ul>

**Criterion: 80% of students will average 2 in Runtime Correctness and Problem Solving.**

## Assessment Data Mathematical, Information and Computer Sciences

**Learning Outcome:** Students will analyze the interaction between hardware and software.

**Outcome Measure:** Annual (CS and IS): CSC3014 Signature Assignment.

**Criteria for Success:** CSC3014 Assignment: 80% of the students should have an average score of at least 7.

**Aligned with DQP Learning Areas (circle one or more):**

1. Specialized Knowledge
2. Broad Integrative Knowledge
3. Intellectual Skills/Core Competencies
4. Applied and Collaborative Learning, and
5. Civic and Global Learning

**Longitudinal Data:**

	Percentage of Class at 7 or Higher									
	2011-12	2012-13	2013-14	2014-15	2015-16	2016-17	2017-18	2018-19	2019-20	2020-21
Hardware/software interaction understanding	85%	89%	82%	92%	88%	75%	69%	100%	92%	44%

**Conclusions Drawn from Data:** Students have been able to successfully master the material in the CSC3014 assessment. For most years, the variations appear to be related to sample size. However in 2020-21 the score dropped significantly. However this assessment was part of a final exam given in the Spring of 2021 during the COVID pandemic. Students were very tired and this score may be an indication of that fact as much as an indication of their knowledge.

**Changes to be Made Based on Data:** Continue to require operating systems (CSC3014) of all CS and IS students. Monitor the results in the 2021-22 to year to confirm that 2020-21 data was an aberration.

Note that we have discontinued using the ETS Major Field Test in Computer Science since it was not providing a useful measure of student learning, and will now rely on assessing this outcome using just an embedded assignment in a course.

**Rubric Used (CSC3014):** The scoring for this assignment is purely points based.

	<b>Unsatisfactory (1)</b>	<b>Satisfactory (2)</b>	<b>Good (3)</b>	<b>Excellent (4)</b>
<b>Points gained by showing understanding of software/hardware interaction in answering question</b>	6 and below	7	8	9-10

**Rubric Used (ETS):** Scoring done by ETS on the Major Field Test.

Critically analyze and apply business knowledge to solve complex business situations.

Waiting on data from FSB.

Apply critical thinking, technical and information systems knowledge to solve problems.

Waiting on data from FSB

**Fermanian School of Business  
PLO #1 Assessment  
2020-2021**

**Learning Outcome:**

MICS PLO #3/FSB PLO #1: Exhibit general knowledge of theories and practices in the core areas of business.

**Outcome Measure:**

Peregrine Comprehensive Exit Exam Results

**Criteria for Success:**

Score at or above the following:

<b>Peregrine Undergraduate Comprehensive Exit Exam Criteria for Success</b>	
Disciplinary Area	Score
Accounting	50
Business Ethics	50
Business Finance	45
Strategic Management	55
Business Leadership	50
Economics (Macro/Micro)	50
Global Dimensions of Business	45
Information Mgt Systems	50
Legal Environment of Business	50
Management (OPS, HR, OB)	55
Marketing	50
Quantitative Techniques/Stats	45

**Aligned with DQP Learning Areas (circle one or more but not all five):**

1. Specialized Knowledge
2. Broad Integrative Knowledge
3. Intellectual Skills/Core Competencies
4. Applied and Collaborative Learning, and
5. Civic and Global Learning

**Longitudinal Data:**

	Undergraduate Total	Accounting	Business Ethics	Business Finance	Strategic Management	Business Leadership	Economics (Macro/Micro)	Global Dimensions of Business	Information Mgt Systems	Legal Environment of Business	Management (OPS, HR, OB)	Marketing	Quantitative Techniques/Stats
Criteria for Success	50	50	45	55	50	50	45	50	50	55	50	45	
2016-2017	50.2	54.6	48.3	48.5	54.9	47.9	52.2	44.8	53.6	49.1	51.0	49.6	47.1
2017-2018	49.8	53.9	47.1	49.8	51.5	48.9	50.1	45.6	51.9	51.5	50.9	53.3	43.5
2018-2019	51.1	50.9	48.6	46.4	54.9	54.0	52.3	48.0	50.1	55.2	50.3	55.2	47.4
2019-2020	51.2	50.7	52.1	47.6	54.3	52.3	53.3	48.0	51.3	53.1	49.1	55.6	46.8
2020-2021	52.8	48.7	51.4	51.3	56.9	55.0	53.7	49.7	51.9	56.1	51.6	60.2	46.7

**Conclusions Drawn from Data:**

It is important to note that PLNU’s methodology of administering the Peregrine Comprehensive Exam is proctored and students are given a two-hour time limit to complete the test. According to Peregrine, a majority of the schools who administer the Peregrine Comprehensive Exam do so in an un-proctored format with time limits up to 48 hours. Therefore, criteria for success were determined considering: (a) average total score and average disciplinary area scores of National and Region 7 ACBSP schools, (b) the FSB’s undergraduate curriculum and (c) the FSB’s historical disciplinary area scores.

During AY 16-17, the criteria for success were exceeded for five of the twelve disciplinary areas. Scores in the areas of Strategic Management and Global Dimensions of Business were slightly below (within 0.2 points) the criteria for success. Scores in the remaining five areas were below the criteria for success, including Business Ethics, Business Leadership, Legal Environment of Business, Management and Marketing as indicated in the table above.

During AY 17-18, the criteria for success were exceeded for seven of the twelve disciplinary areas. Scores in the areas of Business Leadership and Quantitative Techniques and Statistics were slightly below (within 1.5 points) the criteria for success. Scores in the remaining three areas were below the criteria for success, including Business Ethics, Strategic Management, and Management.

During AY 18-19, the criteria for success were exceeded for nine of the twelve disciplinary areas. The average score in the area of Strategic Management was 0.1 points below the criteria for success. The average score in the area of Business Ethics was slightly below (within 1.4 points) the criteria for success. The average score in the area of Management was 4.7 points below the criteria for success.

During AY 19-20, the criteria for success were exceeded for ten of the twelve disciplinary areas. The average score in the area of Strategic Management was 0.7 points below the criteria for success. The average score in the area of Management was 5.9 points below the criteria for success.

During AY 20-21, the criteria for success were exceeded for ten of the twelve disciplinary areas. The average score in the area of Accounting was 1.3 points below the criteria for success. The average score in the area of Management was 3.4 points below the criteria for success.

### **Changes to be Made Based on Data:**

Management has been recognized as an area needing improvement. Scores in this area have been consistently below the criteria for success; however, the recent AY 20-21 results indicate a positive trend. Content in operations management was added to MGT2012 Principles of Management beginning Fall 2017. Students taking this improved MGT2012 course began graduating in Spring 2020; however, the scores for AY 19-20 did not increase as a result; however, scores in AY 20-21 increased by 2.5 points compared to AY 19-20. Additional analysis regarding MGT 2012 Principles of Management content will be revisited in Spring 2022, including the areas of human resources, operations management, and organizational behavior.

Accounting has been trending downward over the last five years and has dropped slightly below the criteria for success in AY 20-21, for the first time in last 5-year period. This area will be closely monitored.

The criteria for success will be revisited by the assessment committee in Fall 2021. With ten of twelve scores above the criteria for success in AY 19-20 and AY 20-21, the FSB will consider increasing the criteria for success in areas deemed appropriate.

**Draft 10.12.21**

**Approved by Assessment Committee 10.20.21**

**Approved by FSB Full Faculty 11.01.21**

**Fermanian School of Business  
PLO #2 Assessment  
2020-2021**

**Learning Outcome:**

MICS PLO #4/FSB PLO #2: Critically analyze and apply business knowledge to solve complex business situations.

**Outcome Measure:**

The CAPSIM COMP-XM Management Simulation provides comparative data on how each student (and class) performs against all other students taking the simulation and exam at the same time nationally. Two results are used:

1. CAPSIM COMP-XM Balanced Score Card Results – Application-based
2. CAPSIM COMP-XM Simulation Board Query Results – Knowledge-based

**Criteria for Success:**

1. Average score of all students will be above 70<sup>th</sup> percentile on the national COMP-XM Balanced Score Card Results
2. Average score of all students will be above 55<sup>th</sup> percentile on the national COMP-XM Board Query Results

**Aligned with DQP Learning Areas (circle one or more but not all five):**

1. Specialized Knowledge
2. Broad Integrative Knowledge
3. Intellectual Skills/Core Competencies
4. Applied and Collaborative Learning, and
5. Civic and Global Learning

**Longitudinal Data:**

Semester	N <sup>1</sup>	Balanced Score Card Results (%)	Board Query Results (%)
Fall 2016	60	80	86
Spring 2017	68	80	71
Fall 2017	81	60	53
Spring 2018	56	82	64
Fall 2018	64	65	72
Spring 2019	70	53	-
Summer 2019	13	24.5	41.5
Fall 2019	60	66	64
Spring 2020	54	58	42
Summer 2020	N/A	N/A	N/A
Fall 2020	64	58	55
Spring 2021	70	58	45
Summer 2021	31	62	51

<sup>1</sup> Number of Students Completing Module

Note: Board Query results not collected in Spring 2019

**Draft 10.12.21  
Approved by Assessment Committee 10.20.21  
Approved by FSB Full Faculty 11.01.21**

### **Conclusions Drawn from Data:**

Due primarily to the fact that the Summer 2020 term was fully remote (as a result of COVID-19), the Summer 2020 data is not reliable due to all students not completing all parts of the simulation and related assignments or students not being fully prepared for the simulation and related assignments; therefore, no Summer 2020 data is included above.

Scores on the COMP-XM Balanced Score Card exceeded the criteria for success in three of the twelve semesters. A downward trend has been noted beginning Fall 2018, with students averaging between the 24<sup>th</sup> and 66<sup>th</sup> percentile.

Scores on the COMP-XM Board Query exceeded the criteria for success in six of the twelve semesters. However, four of the six most recent semesters have been below the criteria for success. Data was not collected in Spring 2019 due to a miscommunication with the instructor.

### **Changes to be Made Based on Data:**

It is important to note that since December of 2018, new faculty have been teaching MGT4088 Strategic Management. The new faculty teaching Strategic Management have attended specialized training on the simulation. In addition, during AY 20-21 faculty reviewed and during AY 21-22 will continue to review the existing simulation modules used, adjust the specific modules used, and adjust the approach to applying the modules as necessary in MGT4088. Furthermore, the criteria for success will be reviewed by the assessment committee in Fall 2021 to ensure they are appropriate.

Note: Board Query results not collected in Spring 2019

**Draft 10.12.21**  
**Approved by Assessment Committee 10.20.21**  
**Approved by FSB Full Faculty 11.01.21**

## Assessment Data Mathematical, Information and Computer Sciences

**Learning Outcome:** Students will be able to apply their technical knowledge and critical thinking to solve problems.

**Outcome Measure:** Alternating Year: ISS4014 Signature Assignment using data bases.

ETS Proficiency Profile: Critical Thinking/Reading Portion.

**Criteria for Success:** 80% of the students should have an average score of at least 2.5 in each of the major areas.

ETS PP: 85% of the students will be marginal or proficient at Level 2 Reading/Critical Thinking.

**Aligned with DQP Learning Areas (circle one or more):**

1. Specialized Knowledge
2. Broad Integrative Knowledge
3. Intellectual Skills/Core Competencies
4. Applied and Collaborative Learning, and
5. Civic and Global Learning

**Longitudinal Data:**

	Percentage of Class at 2.5 or Higher				
	2011-12	2013-14	2015-16	2017-18	2019-20
Relevant Information Chosen	100%	100%	88%	89%	88%
Query Correctness	25%	100%	48%	41%	83%

ETS Proficiency Profile	Percentage of Students Marginal or Proficient								
	2012-13	2013-14	2014-15	2015-16	2016-17	2017-18	2018-19	2019-20	2020-21
ETS Proficiency Profile Level 2 Critical Thinking	80%	92%	100%	84%	92%	76%	79%	80%	88%

\*ETS is for the full department.

**Conclusions Drawn from Data:** ISS4014 Assignment: The 2012 class was relatively small and that led to a fairly large standard deviation. Seventy-five percent of the class would have passed query correctness if the benchmark had been 2.3. We once again saw some problems with query correctness in 2015-16 and in 2017-18. In both cases, had the threshold for success be lowered slightly (2 vs 2.5), many more students would have succeeded. In 2019-20 we saw an improvement in query correctness. The assignment was modified a bit to be clearer for students.

ETS: The students are generally hitting our benchmark in this area, with small sample sizes hitting or missing the benchmark can be a matter of a single person's score.

**Changes to be Made Based on Data:** Spend more time in class emphasizing queries. This class is being revised in light of some new curricular changes. In 2015-16 the class was changed significantly. It focused on both data bases and website construction. Less time is being spend on data bases. In 2017-18 the course content was adjusted again. We need to continue to review this signature assignment in light of the changed course content. The signature was updated in 2019-20 based on the review of content.

## Rubric Used

	<b>Unsatisfactory (1)</b>	<b>Satisfactory (2)</b>	<b>Good (3)</b>	<b>Excellent (4)</b>
<b>Recognition of relevant information</b>	3 errors (an error is defined as missing a relevant database field or listing an irrelevant field)	2 errors (an error is defined as missing a relevant database field or listing an irrelevant field)	1 error (an error is defined as missing a relevant database field or listing an irrelevant field)	All relevant database fields are listed and no irrelevant fields are listed for both queries
<b>Query correctness</b>	3 mistakes in the 2 queries	2 mistakes in the 2 queries	1 mistake in the 2 queries	No mistakes in the two queries

## Assessment Data Mathematical, Information and Computer Sciences

**Learning Outcome:** Students will be able to speak about their work with precision, clarity and organization (Oral Communication).

**Outcome Measure:** Annual: Each student will be required to give an oral presentation on a topic in their field as a part of their participation in the Senior Seminar. The audience for this talk will include department faculty, fellow students and possibly some alumni. The students will be given the evaluation criteria in advance of their presentation and will be rated by the faculty using a rubric with a scale of 4 (outstanding) to 1 (unsatisfactory) in the following areas:

- Command of background material
- Organization
- Oral presentation skills (added as part of the new rubric in the spring of 2010)
- Use of presentation tools
- Ability to field questions from the audience

Note that the department has a mapping between its rubric and the AAC&U Oral Communication Value Rubric.

**Criteria for Success:** 80% of the students should have an average score of at least 2.5 in each of the major areas in the department rubric. This translates to 80% of the students being above a 3.5 in the AAC&U rubric.

Our translation from our data to the AAC&U is included. Our department continues to provide the students with our departmental rubric because it has been developed over many years and works effectively with our majors.

**Aligned with DQP Learning Areas (circle one or more):**

1. Specialized Knowledge
2. Broad Integrative Knowledge
3. Intellectual Skills/Core Competencies
4. Applied and Collaborative Learning, and
5. Civic and Global Learning

**Longitudinal Data:**

<b>Oral Presentation</b>	2010-11	2011-12	2012-13	2013-14	2014-15	2015-16	2016-17	2017-18	2018-19	2019-20	2020-21
Background	95%	100%	100%	92%	100%	95%	100%	100%	95%	100%	100%
Organization	85%	100%	100%	100%	100%	100%	92%	94%	100%	100%	94%
Oral Presentation Skills	90%	100%	100%	92%	100%	95%	100%	100%	95%	100%	100%
Presentation Tools	100%	100%	100%	100%	100%	100%	100%	100%	100%	100%	100%
Ability to Field Questions	100%	83%	100%	100%	89%	100%	100%	100%	94%	94%	100%

AAC&U “translation” (we have only done this for the years that PLNU has been making use of the DQP)

<b>Oral AAC&amp;U</b>	2012-13	2013-14	2014-15	2015-16	2016-17	2017-18	2018-19	2019-20	2020-21
Organization	100%	100%	100%	100%	92%	94%	100%	100%	94%
Language	100%	92%	100%	100%	100%	100%	95%	100%	100%
Delivery	100%	92%	100%	95%	100%	100%	95%	100%	100%
Supporting Material	100%	100%	100%	100%	100%	100%	100%	100%	100%
Central Message	100%	100%	89%	100%	100%	100%	94%	100%	100%

**Conclusions Drawn from Data:** In general, the students have been performing reasonably well in the area of giving oral presentations. We attribute this to the fact that we intentionally have students presenting technical material in front of others starting in their freshman year.

**Changes to be Made Based on Data:** Over time we have increased our standards and expanded the rubric to increase clarity for students and to push them to speak at a professional level. We have been incorporating more oral presentations into classes and saw an improvement once we began doing that (before 2010). While we have been making a conversion to the AAC&U Value Rubric, it seems that this data is not being used institutionally and our focus has been on our department’s rubric.

**Oral Presentation Rubric Update (4/12/17)**

<b>Criteria</b>	<b>Outstanding</b>	<b>High Satisfactory</b>	<b>Low Satisfactory</b>	<b>Unsatisfactory</b>
<b>Command of background material</b>	<input type="checkbox"/> Clearly knows material and key facts by memory <input type="checkbox"/> Expands on PPT slides <input type="checkbox"/> Content appropriate for audience	<input type="checkbox"/> Clearly knows key facts with a few memory slips <input type="checkbox"/> Some expansion on PPT slides <input type="checkbox"/> Partial audience adaptation of content	<input type="checkbox"/> Reads some information; knows some facts from memory <input type="checkbox"/> No expansion of PPT slide content <input type="checkbox"/> Little audience adaptation of content	<input type="checkbox"/> Reads sentences from slides <input type="checkbox"/> Dependent on notes <input type="checkbox"/> Lacks audience adaptation of content
<b>Organization</b>	<input type="checkbox"/> Clear and concise outline <input type="checkbox"/> Relevant graphics and key text items on slides <input type="checkbox"/> Presentation is between 10-15 minutes	<input type="checkbox"/> Clear outline <input type="checkbox"/> Too much information on slides (not concise) <input type="checkbox"/> Presentation 1 minute outside of the range (10-15 minutes)	<input type="checkbox"/> Some sense of outline <input type="checkbox"/> Too much detailed information on slides <input type="checkbox"/> Presentation 2 minutes outside of the range (10-15 minutes)	<input type="checkbox"/> No clear outline <input type="checkbox"/> Slides are in paragraphs; too much detailed information on one slide <input type="checkbox"/> Presentation 3 minutes outside of the range (10-15 minutes)
<b>Oral presentation skills</b>	<input type="checkbox"/> Clearly has practiced several times; smooth transitions <input type="checkbox"/> Engages audience in content multiple times and engagement is well connected to talk (questions, examples, etc.) <input type="checkbox"/> Free of disfluencies (ah, umh) <input type="checkbox"/> Is clearly heard in the room and uses inflection for emphasis <input type="checkbox"/> Engages audience through eye contact <input type="checkbox"/> Engages audience through gestures	<input type="checkbox"/> Has practiced but transitions are not smooth <input type="checkbox"/> Engages audience at least twice in content (questions, examples, etc.) <input type="checkbox"/> A few disfluencies (ah, umh, er) <input type="checkbox"/> Can be understood most of the time and uses some inflection <input type="checkbox"/> Some engagement of audience through eye contact <input type="checkbox"/> Some engagement of audience through gestures	<input type="checkbox"/> Has practiced presentation but cannot verbally make transitions between slides <input type="checkbox"/> Audience engagement at least once with content (questions, examples, etc.) <input type="checkbox"/> Many disfluencies (ah, umh, er) <input type="checkbox"/> Can sometimes be understood and uses little inflection <input type="checkbox"/> Infrequent eye contact <input type="checkbox"/> Distracting gestures or mannerisms	<input type="checkbox"/> Clearly did not practice presentation; Does not anticipate content of next slide <input type="checkbox"/> No audience involvement <input type="checkbox"/> Disfluencies (ah, umh, er) detract from presentation <input type="checkbox"/> Can not be heard and/or speaks in a monotone <input type="checkbox"/> Little audience awareness or eye contact <input type="checkbox"/> Frequent distracting gestures or mannerisms
<b>Use of presentation tools</b>	<input type="checkbox"/> PPT background is matched to content, legible font, seamless transitions <input type="checkbox"/> Graphics imbedded and matched to topic, necessary hyperlinks work	<input type="checkbox"/> Appropriate PPT slide backgrounds, transitions & font <input type="checkbox"/> Most graphics imbedded and matched to topic, most necessary hyperlinks work	<input type="checkbox"/> Distracting PPT slide backgrounds and transitions, font hard to read <input type="checkbox"/> Some inappropriate graphics or use of PPT embellishments, necessary hyperlinks don't work	<input type="checkbox"/> No attention given to PPT slide backgrounds and transitions, font illegible <input type="checkbox"/> Distracting use of embellishments, graphics not connected to topic
<b>Ability to field questions</b>	<input type="checkbox"/> Able to answer questions clearly and without hesitation and prepared material to answer anticipated questions	<input type="checkbox"/> Can answer all questions with some hesitation	<input type="checkbox"/> Able to answer half of the questions with hesitation	<input type="checkbox"/> Unable to answer any questions

Translation between MICS and AAC&U Rubric

MICS Category	MICS Item Position in Rubric	AAC&U Category
Clear and concise outline	4	Organization
Relevant graphics and key text items on slides	5	Organization
Presentation length is +/- 30 seconds of time limit	6	Organization
Expands on PPT slides	2	Language
Content appropriate for audience	3	Language
Engages audience	8	Language
Transitions	7	Delivery
Free of disfluencies (ah, uhm, er)	9	Delivery
Is clearly heard in the room and uses inflection for emphasis	10	Delivery
Engages audience through eye contact	11	Delivery
Engages audience through gestures	12	Delivery
PPT background is matched to content, legible font, seamless transitions	13	Delivery
Relevant graphics and key text items on slides	5	Supporting
Graphics imbedded and matched to topic, necessary hyperlinks work	14	Supporting
Clearly knows material and key facts by memory	1	Central Message
Able to answer questions clearly and without hesitation	15	Central Message

**AAC&U Value Rubric**

	<b>Capstone 4</b>	<b>Milestones 3</b>	<b>Milestones 2</b>	<b>Benchmark 1</b>
<b>Organization</b>	Organizational pattern (specific introduction and conclusion, sequenced material within the body, and transitions) is clearly and consistently observable and is skillful and makes the content of the presentation cohesive.	Organizational pattern (specific introduction and conclusion, sequenced material within the body, and transitions) is clearly and consistently observable within the presentation.	Organizational pattern (specific introduction and conclusion, sequenced material within the body, and transitions) is intermittently observable within the presentation.	Organizational pattern (specific introduction and conclusion, sequenced material within the body, and transitions) is not observable within the presentation.
<b>Language</b>	Language choices are imaginative, memorable, and compelling, and enhance the effectiveness of the presentation. Language in presentation is appropriate to audience.	Language choices are thoughtful and generally support the effectiveness of the presentation. Language in presentation is appropriate to audience.	Language choices are mundane and commonplace and partially support the effectiveness of the presentation. Language in presentation is appropriate to audience.	Language choices are unclear and minimally support the effectiveness of the presentation. Language in presentation is not appropriate to audience.
<b>Delivery</b>	Delivery techniques (posture, gesture, eye contact, and vocal expressiveness) make the presentation compelling, and speaker appears polished and confident.	Delivery techniques (posture, gesture, eye contact, and vocal expressiveness) make the presentation interesting, and speaker appears comfortable.	Delivery techniques (posture, gesture, eye contact, and vocal expressiveness) make the presentation understandable, and speaker appears tentative.	Delivery techniques (posture, gesture, eye contact, and vocal expressiveness) detract from the understandability of the presentation, and speaker appears uncomfortable.
<b>Supporting Material</b>	A variety of types of supporting materials (explanations, examples, illustrations, statistics, analogies, quotations from relevant authorities) make appropriate reference to information or analysis that significantly supports the presentation or establishes the presenter's credibility/authority on the topic.	Supporting materials (explanations, examples, illustrations, statistics, analogies, quotations from relevant authorities) make appropriate reference to information or analysis that generally supports the presentation or establishes the presenter's credibility/authority on the topic.	Supporting materials (explanations, examples, illustrations, statistics, analogies, quotations from relevant authorities) make appropriate reference to information or analysis that partially supports the presentation or establishes the presenter's credibility/authority on the topic.	Insufficient supporting materials (explanations, examples, illustrations, statistics, analogies, quotations from relevant authorities) make reference to information or analysis that minimally supports the presentation or establishes the presenter's credibility/authority on the topic.
<b>Central Message</b>	Central message is compelling (precisely stated, appropriately repeated, memorable, and strongly supported.)	Central message is clear and consistent with the supporting material.	Central message is basically understandable but is not often repeated and is not memorable.	Central message can be deduced, but is not explicitly stated in the presentation.

## Assessment Data Mathematical, Information and Computer Sciences

**Learning Outcome:** Students will be able to write about their work with precision, clarity and organization (Written Communication).

**Outcome Measure:** Annual: Each student will be required to write a paper on a topic in their field as a part of their participation in the Senior Seminar. The audience for this talk will include department faculty, fellow students and possibly some alumni. The students will be given the evaluation criteria in advance of their presentation and will be rated by the faculty using a rubric with a scale of 4 (outstanding) to 1 (unsatisfactory) in the following areas:

- Bibliography and other supporting documentation
- Organization
- Grammar and spelling
- Depth of information
- Clarity of writing

Note that the department has a mapping between its rubric and the AAC&U Written Communication Value Rubric.

Annual: ETS Proficiency Profile.

**Criteria for Success:** 80% of the students should have an average score of at least 2.5 in each of the major areas in the department rubric. This translates to 80% of the students being above a 3.5 in the AAC&U rubric.

ETS: 85% of our students will be marginal or proficient on the Level 2 Writing test.

Our translation from our data to the AAC&U is included. Our department continues to provide the students with our departmental rubric because it has been developed over many years and works effectively with our majors.

**Aligned with DQP Learning Areas (circle one or more):**

1. Specialized Knowledge
2. Broad Integrative Knowledge
3. Intellectual Skills/Core Competencies
4. Applied and Collaborative Learning, and
5. Civic and Global Learning

**Longitudinal Data:**

<b>Written Report</b>	2010-11	2011-12	2012-13	2013-14	2014-15	2015-16	2016-17	2017-18	2018-19	2019-20	2020-21
Bibliography and Support	55%	93%	100%	100%	100%	89%	100%	76%	89%	81%	88%
Organization	65%	93%	100%	100%	100%	100%	92%	94%	100%	100%	100%
Grammar and Spelling	60%	79%	100%	92%	89%	84%	100%	88%	94%	94%	94%
Depth of Information	50%	93%	91%	77%	78%	89%	85%	76%	83%	94%	94%
Clarity of Writing	70%	79%	91%	77%	78%	89%	85%	88%	94%	88%	100%

AAC&U “translation” (we have only done this for the years that PLNU has been making use of the DQP)

<b>Written AAC&amp;U</b>	2012-13	2013-14	2014-15	2015-16	2016-17	2017-18	2018-19	2019-20	2020-21
Context and Purpose for Writing	100%	100%	100%	89%	92%	94%	100%	100%	100%
Content Development	100%	92%	100%	89%	85%	76%	83%	94%	94%
Genre and Disciplinary Conventions	100%	92%	100%	100%	85%	94%	100%	81%	94%
Sources and Evidence	100%	100%	100%	89%	100%	76%	89%	88%	88%
Control of Syntax and Mechanics	100%	100%	89%	84%	85%	88%	94%	100%	94%

<b>Written ETS</b>	Percentage at Marginal or Proficient								
	2012-13	2013-14	2014-15	2015-16	2016-17	2017-18	2018-19	2019-20	2020-21
ETS Proficiency Profile Writing Level 2	60%	85%	100%	89%	85%	76%	84%	93%	88%

**Conclusions Drawn from Data:** In general, the students have been performing reasonably well in writing technical reports. We still have some weaknesses in the quality of their writing and the use of their source material. The sample size for ETS in the first year was extremely small so we are not particularly concerned about the fact that the score was below the benchmark. The balance of the ETS scores are at or near benchmark (due to small sample sizes, the difference can often be a single person).

**Changes to be Made Based on Data:** Over time we have increased our standards and expanded the rubric to increase clarity for students and to push them to write at a professional level. The current rubric has been in use for the last 11 years. We have instituted more formal faculty reviews of their draft papers and are trying to give more specific feedback, particularly about the use of references and that seems to be helping with the quality of the papers.

**MICS Written Presentation Rubric**

<b>Criteria</b>	<b>Outstanding</b>	<b>High Satisfactory</b>	<b>Low Satisfactory</b>	<b>Unsatisfactory</b>
Bibliography and supporting documents	<input type="checkbox"/> Multiple references from distinct reputable sources  <input type="checkbox"/> References cited in the body of the document	<input type="checkbox"/> Most references from distinct reputable sources  <input type="checkbox"/> Some citation of references in the body of the document	<input type="checkbox"/> Some references from reputable sources  <input type="checkbox"/> Limited citation of references in the body of the document	<input type="checkbox"/> No bibliography or all references from untrusted sites on the internet  <input type="checkbox"/> No citation of references in the body of the document
Organization	<input type="checkbox"/> Conveys a central theme with all ideas connected, arrangement of ideas clearly related to topic  <input type="checkbox"/> Clear introduction, body (with sections), and conclusion includes summary and closure  <input type="checkbox"/> Includes both an abstract and table of contents	<input type="checkbox"/> Conveys a central idea or topic with some ideas connected to the topic  <input type="checkbox"/> Includes introduction, body and conclusion  <input type="checkbox"/> Includes abstract and table of contents (one partial and one complete)	<input type="checkbox"/> Attempts to focus on an idea or topic with many ideas not connected to the topic  <input type="checkbox"/> Introduction, body, conclusion detectable but not clear  <input type="checkbox"/> Includes partial abstract and partial table of contents	<input type="checkbox"/> Has little or no focus on central idea or topic  <input type="checkbox"/> Introduction, body or conclusion absent  <input type="checkbox"/> No abstract or table of contents
Grammar and spelling	<input type="checkbox"/> No use of first-person tense  <input type="checkbox"/> No grammatical or spelling errors	<input type="checkbox"/> Few uses of the first-person tense  <input type="checkbox"/> Few grammatical and spelling errors	<input type="checkbox"/> Several uses of the first-person tense  <input type="checkbox"/> Some grammatical and spelling errors	<input type="checkbox"/> Written in first-person tense  <input type="checkbox"/> Many grammatical and spelling errors
Depth of information	<input type="checkbox"/> Appropriately synthesizes information from multiple distinct sources  <input type="checkbox"/> Draws conclusions and personal insights from synthesis  <input type="checkbox"/> Has the minimum number of pages including penalty pages; subject coverage is excellent	<input type="checkbox"/> Synthesis of information from at least three distinct sources  <input type="checkbox"/> At least two personal insights or conclusions stated  <input type="checkbox"/> Has the minimum number of pages including penalty pages; subject coverage is good	<input type="checkbox"/> Synthesis of information from at least two distinct sources  <input type="checkbox"/> At least one personal insight or conclusion stated  <input type="checkbox"/> Has the minimum number of pages including penalty pages; subject coverage is adequate	<input type="checkbox"/> Summary reporting of information without synthesis  <input type="checkbox"/> No personal insights  <input type="checkbox"/> Does not have the minimum number of pages including penalty pages
Clarity of writing	<input type="checkbox"/> Sentences flow  <input type="checkbox"/> Smooth transitions between paragraphs  <input type="checkbox"/> Any and all terms and acronyms are defined  <input type="checkbox"/> Provides evidence to support points	<input type="checkbox"/> Good sentence structure  <input type="checkbox"/> Adequate transitions between paragraphs  <input type="checkbox"/> Most terms and acronyms are defined  <input type="checkbox"/> Lacks support for some points	<input type="checkbox"/> Occasional poor sentence structure  <input type="checkbox"/> Transitions between paragraphs unclear  <input type="checkbox"/> Some terms and acronyms are defined  <input type="checkbox"/> Provides minimal support for points	<input type="checkbox"/> Frequent poor sentence structure  <input type="checkbox"/> Lacked transitions between paragraphs  <input type="checkbox"/> Many terms and acronyms are undefined  <input type="checkbox"/> Ideas not supported

Translation between MICS and AAC&U Rubric

MICS Category	MICS Item Position in Rubric	AAC&U Category
Conveys a central theme with all ideas connected, arrangement of ideas clearly related to topic	3	Purpose
Appropriately synthesizes information from multiple distinct sources	8	Development
Draws conclusions and personal insights from synthesis	9	Development
Has the minimum number of pages including penalty pages; subject coverage is excellent	10	Development
Provides evidence to support points	14	Development
Clear introduction, body (with sections), and conclusion includes summary and closure	4	Genre
Includes both an abstract and table of contents	5	Genre
Multiple references from distinct reputable sources	1	Source
References cited in the body of the document	2	Source
No use of first-person tense	6	Syntax
No grammatical or spelling errors	7	Syntax
Sentences flow	11	Syntax
Smooth transitions between paragraphs	12	Syntax
Any and all terms and acronyms are defined	13	Syntax

**AAC&U Written Communication Value Rubric**

	<b>Capstone 4</b>	<b>Milestones 3</b>	<b>Milestones 2</b>	<b>Benchmark 1</b>
<b>Context of and Purpose for Writing</b> <i>Includes considerations of audience, purpose, and the circumstances surrounding the writing task(s).</i>	Demonstrates a thorough understanding of context, audience, and purpose that is responsive to the assigned task(s) and focuses all elements of the work.	Demonstrates adequate consideration of context, audience, and purpose and a clear focus on the assigned task(s) (e.g., the task aligns with audience, purpose, and context).	Demonstrates awareness of context, audience, purpose, and to the assigned task(s) (e.g., begins to show awareness of audience's perceptions and assumptions).	Demonstrates minimal attention to context, audience, purpose, and to the assigned task(s) (e.g., expectation of instructor or self as audience).
<b>Content Development</b>	Uses appropriate, relevant, and compelling content to illustrate mastery of the subject, conveying the writer's understanding, and shaping the whole work.	Uses appropriate, relevant, and compelling content to explore ideas within the context of the discipline and shape the whole work.	Uses appropriate and relevant content to develop and explore ideas through most of the work.	Uses appropriate and relevant content to develop simple ideas in some parts of the work.
<b>Genre and Disciplinary Conventions</b> <i>Formal and informal rules inherent in the expectations for writing in particular forms and/or academic fields (please see glossary).</i>	Demonstrates detailed attention to and successful execution of a wide range of conventions particular to a specific discipline and/or writing task(s) including organization, content, presentation, formatting, and stylistic choices.	Demonstrates consistent use of important conventions particular to a specific discipline and/or writing task(s), including organization, content, presentation, and stylistic choices.	Follows expectations appropriate to a specific discipline and/or writing task(s) for basic organization, content, and presentation.	Attempts to use a consistent system for basic organization and presentation.
<b>Sources and Evidence</b>	Demonstrates skillful use of high-quality, credible, relevant sources to develop ideas that are appropriate for the discipline and genre of the writing.	Demonstrates consistent use of credible, relevant sources to support ideas that are situated within the discipline and genre of the writing.	Demonstrates an attempt to use credible and/or relevant sources to support ideas that are appropriate for the discipline and genre of the writing.	Demonstrates an attempt to use sources to support ideas in the writing.
<b>Control of Syntax and Mechanics</b>	Uses graceful language that skillfully communicates meaning to readers with clarity and fluency, and is virtually error-free.	Uses straightforward language that generally conveys meaning to readers. The language in the portfolio has few errors.	Uses language that generally conveys meaning to readers with clarity, although writing may include some errors.	Uses language that sometimes impedes meaning because of errors in usage.

## Assessment Data Mathematical, Information and Computer Sciences

**Learning Outcome:** Students will be able to identify, locate, evaluate, and effectively and responsibly use and cite information for the task at hand (Information Literacy).

**Outcome Measure:** Annual: Each student will be required to write a paper on a topic in their field as a part of their participation in the Senior Seminar. The audience for this talk will include department faculty, fellow students and possibly some alumni. The students will be given the evaluation criteria in advance and their paper will be rated by the faculty using a rubric with a scale of 4 (outstanding) to 1 (unsatisfactory) in the following areas:

- References: Multiple references from distinct reputable sources
- Citation: References cited in the body of the document
- Synthesis: Appropriately synthesizes information from multiple distinct sources

**Criteria for Success:** 80% of the students should have an average score of at least 2.5 in each of the major areas.

**Aligned with DQP Learning Areas (circle one or more):**

1. Specialized Knowledge
2. Broad Integrative Knowledge
3. Intellectual Skills/Core Competencies
4. Applied and Collaborative Learning, and
5. Civic and Global Learning

**Longitudinal Data:**

Information Literacy	Percentage of Students at 2.5 or Higher					
	2015-16	2016-17	2017-18	2018-19	2019-20	2020-21
References	95%	100%	71%	89%	81%	94%
Citation	84%	92%	76%	89%	81%	88%
Synthesis	84%	85%	82%	78%	81%	94%

Note that in 2015-16 we returned to gathering information literacy data from our writing rubric. The AAC&U rubric was not working well for our purposes. The data shown is just for 2015 and later.

**Conclusions Drawn from Data:** The students are meeting our expectations. This is still one of the areas with which the students have the most challenges.

**Changes to be Made Based on Data:** We found that we needed to be very specific about our expectations for the use and citation of information in papers. As we have improved the rubric, the students have improved. We continue to work with students in giving them clear feedback about the need to do a better job with references in technical papers.

**Rubric:** Next Page.

### MICS Information Literacy Presentation Rubric

Criteria	Outstanding	High Satisfactory	Low Satisfactory	Unsatisfactory
Bibliography and supporting documents	<ul style="list-style-type: none"> <li><input type="checkbox"/> Multiple references from distinct reputable sources</li> <li><input type="checkbox"/> References cited in the body of the document</li> </ul>	<ul style="list-style-type: none"> <li><input type="checkbox"/> Most references from distinct reputable sources</li> <li><input type="checkbox"/> Some citation of references in the body of the document</li> </ul>	<ul style="list-style-type: none"> <li><input type="checkbox"/> Some references from reputable sources</li> <li><input type="checkbox"/> Limited citation of references in the body of the document</li> </ul>	<ul style="list-style-type: none"> <li><input type="checkbox"/> No bibliography or all references from untrusted sites on the internet</li> <li><input type="checkbox"/> No citation of references in the body of the document</li> </ul>
Organization	<ul style="list-style-type: none"> <li><input type="checkbox"/> Conveys a central theme with all ideas connected, arrangement of ideas clearly related to topic</li> <li><input type="checkbox"/> Clear introduction, body (with sections), and conclusion includes summary and closure</li> <li><input type="checkbox"/> Includes both an abstract and table of contents</li> </ul>	<ul style="list-style-type: none"> <li><input type="checkbox"/> Conveys a central idea or topic with some ideas connected to the topic</li> <li><input type="checkbox"/> Includes introduction, body and conclusion</li> <li><input type="checkbox"/> Includes abstract and table of contents (one partial and one complete)</li> </ul>	<ul style="list-style-type: none"> <li><input type="checkbox"/> Attempts to focus on an idea or topic with many ideas not connected to the topic</li> <li><input type="checkbox"/> Introduction, body, conclusion detectable but not clear</li> <li><input type="checkbox"/> Includes partial abstract and partial table of contents</li> </ul>	<ul style="list-style-type: none"> <li><input type="checkbox"/> Has little or no focus on central idea or topic</li> <li><input type="checkbox"/> Introduction, body or conclusion absent</li> <li><input type="checkbox"/> No abstract or table of contents</li> </ul>
Grammar and spelling	<ul style="list-style-type: none"> <li><input type="checkbox"/> No use of first-person tense</li> <li><input type="checkbox"/> No grammatical or spelling errors</li> </ul>	<ul style="list-style-type: none"> <li><input type="checkbox"/> Few uses of the first-person tense</li> <li><input type="checkbox"/> Few grammatical and spelling errors</li> </ul>	<ul style="list-style-type: none"> <li><input type="checkbox"/> Several uses of the first-person tense</li> <li><input type="checkbox"/> Some grammatical and spelling errors</li> </ul>	<ul style="list-style-type: none"> <li><input type="checkbox"/> Written in first-person tense</li> <li><input type="checkbox"/> Many grammatical and spelling errors</li> </ul>
Depth of information	<ul style="list-style-type: none"> <li><input type="checkbox"/> Appropriately synthesizes information from multiple distinct sources</li> <li><input type="checkbox"/> Draws conclusions and personal insights from synthesis</li> <li><input type="checkbox"/> Has the minimum number of pages including penalty pages; subject coverage is excellent</li> </ul>	<ul style="list-style-type: none"> <li><input type="checkbox"/> Synthesis of information from at least three distinct sources</li> <li><input type="checkbox"/> At least two personal insights or conclusions stated</li> <li><input type="checkbox"/> Has the minimum number of pages including penalty pages; subject coverage is good</li> </ul>	<ul style="list-style-type: none"> <li><input type="checkbox"/> Synthesis of information from at least two distinct sources</li> <li><input type="checkbox"/> At least one personal insight or conclusion stated</li> <li><input type="checkbox"/> Has the minimum number of pages including penalty pages; subject coverage is adequate</li> </ul>	<ul style="list-style-type: none"> <li><input type="checkbox"/> Summary reporting of information without synthesis</li> <li><input type="checkbox"/> No personal insights</li> <li><input type="checkbox"/> Does not have the minimum number of pages including penalty pages</li> </ul>
Clarity of writing	<ul style="list-style-type: none"> <li><input type="checkbox"/> Sentences flow</li> <li><input type="checkbox"/> Smooth transitions between paragraphs</li> <li><input type="checkbox"/> Any and all terms and acronyms are defined</li> <li><input type="checkbox"/> Provides evidence to support points</li> </ul>	<ul style="list-style-type: none"> <li><input type="checkbox"/> Good sentence structure</li> <li><input type="checkbox"/> Adequate transitions between paragraphs</li> <li><input type="checkbox"/> Most terms and acronyms are defined</li> <li><input type="checkbox"/> Lacks support for some points</li> </ul>	<ul style="list-style-type: none"> <li><input type="checkbox"/> Occasional poor sentence structure</li> <li><input type="checkbox"/> Transitions between paragraphs unclear</li> <li><input type="checkbox"/> Some terms and acronyms are defined</li> <li><input type="checkbox"/> Provides minimal support for points</li> </ul>	<ul style="list-style-type: none"> <li><input type="checkbox"/> Frequent poor sentence structure</li> <li><input type="checkbox"/> Lacked transitions between paragraphs</li> <li><input type="checkbox"/> Many terms and acronyms are undefined</li> <li><input type="checkbox"/> Ideas not supported</li> </ul>

## Assessment Data Mathematical, Information and Computer Sciences

**Learning Outcome:** Students will collaborate effectively in teams.

**Outcome Measure:** Alternating year: CSC324 Signature Assignment – evaluation of group while working on a project (before 2015-16) and ISS342/ISS3042 Project Management – evaluation of group while working on a project (2016-17 and beyond).

Alternating year: MTH3052 Signature Assignment – evaluation of group while working on a project.

**Criteria for Success:** 80% of the students should have an average score of at least 2.5 in each of the major areas.

**Aligned with DQP Learning Areas (circle one or more):**

1. Specialized Knowledge
2. Broad Integrative Knowledge
3. Intellectual Skills/Core Competencies
4. Applied and Collaborative Learning, and
5. Civic and Global Learning

**Longitudinal Data:**

	Percent of students with average at least 2.5				
	Fall 2012 CSC324	Fall 2014 CSC324	Fall 2016 ISS342*	Fall 2018 ISS342	Fall 2020 ISS3042
Contributes to team meetings	86%	80%	90%	100%	100%
Encourages team members	93%	84%	N/A	100%	100%
Contributes individually outside of team meetings	93%	88%	86%	100%	100%
Attitude	100%	96%	N/A	100%	100%
Fosters constructive team climate	100%	92%	N/A	100%	100%
Responds to conflict	100%	100%	90%	100%	100%

\*Note that the full group work rubric will be used in future years.

	MTH352 Percent of students with average at least 2.5				
	Spring 2013	Spring 2015	Spring 2017	Spring 2019	Spring 2021
Contributes to team meetings	91%	86%	100%	100%	100%
Encourages team members	91%	93%	100%	100%	100%
Contributes individually outside of team meetings	82%	93%	100%	100%	100%
Attitude	100%	100%	100%	100%	100%
Fosters constructive team climate	91%	100%	100%	100%	100%
Responds to conflict	91%	100%	100%	100%	100%

**Conclusions Drawn from Data:** The students are performing well as member of teams.

**Changes to be Made Based on Data:** Continue to make use of group activities throughout the curriculum.

## MICS Teamwork Rubric

### Definition

Teamwork is behaviors under the control of individual team members (effort they put into team tasks, their manner of interacting with others on team, and the quantity and quality of contributions they make to team discussions.)

*Evaluators are encouraged to assign a zero to any work sample or collection of work that does not meet unsatisfactory (cell one) level performance.*

**The purpose of this is to evaluate individual team members. Although no team member will ever see your evaluation of them, please take it seriously.**

### Directions:

- **Do not put your own name anywhere on this form, the evaluations are to be anonymous.**
- **Please write the name of the person you are evaluating here .....**\_\_\_\_\_
- **Please fill out one copy of this form for every person who was on your team, including one for yourself.**
- **For each row, place a checkmark in the box that best describes your teammate’s performance.**

	Outstanding	High Satisfactory	Low Satisfactory	Unsatisfactory
<b>Contributes to team meetings</b>	<input type="checkbox"/> Helps the team move forward by articulating the merits of alternative ideas or proposals.	<input type="checkbox"/> Offers new suggestions to advance the work of the group.	<input type="checkbox"/> Shares ideas but does not advance the work of the group.	<input type="checkbox"/> Sits quietly in team meetings and does not contribute.
<b>Encourages members of the team</b>	<input type="checkbox"/> Actively seeks to find opportunities to encourage all members of the team.	<input type="checkbox"/> Offers encouragement to all members of the team.	<input type="checkbox"/> Offers words of encouragement to friends.	<input type="checkbox"/> Does not offer word of encouragement to anyone.
<b>Individual contributions outside of team meetings</b>	<input type="checkbox"/> Completes all assigned tasks by deadline; work accomplished is thorough. Proactively helps other team members complete their assigned tasks.	<input type="checkbox"/> Completes all assigned tasks by deadline; work accomplished is thorough.	<input type="checkbox"/> Completes all assigned tasks by deadline.	<input type="checkbox"/> Does not complete all assigned tasks by deadline.
<b>Attitude</b>	<input type="checkbox"/> Demonstrates (comments, facial expressions, etc.) a negative attitude <b>rarely</b> and helps others to become more positive.	<input type="checkbox"/> Demonstrates (comments, facial expressions, etc.) a negative attitude <b>rarely</b> .	<input type="checkbox"/> Demonstrates (comments, facial expressions, etc.) a negative attitude <b>less</b> often than a positive attitude.	<input type="checkbox"/> Demonstrates (comments, facial expressions, etc.) a negative attitude <b>more</b> often than a positive attitude.

<p><b>Fosters constructive team climate</b></p>	<p><input type="checkbox"/> Supports a constructive team climate by doing <b><u>all of the following</u></b>:</p> <ul style="list-style-type: none"> <li>• Treats team members respectfully by being polite and constructive in communication.</li> <li>• Uses positive vocal or written tone, facial expressions, and/or body language to convey a positive attitude about the team and its work.</li> <li>• Motivates teammates by expressing confidence about the importance of the task and the team's ability to accomplish it.</li> </ul>	<p><input type="checkbox"/> Supports a constructive team climate by doing <b><u>any two of the following</u></b>:</p> <ul style="list-style-type: none"> <li>• Treats team members respectfully by being polite and constructive in communication.</li> <li>• Uses positive vocal or written tone, facial expressions, and/or body language to convey a positive attitude about the team and its work.</li> <li>• Motivates teammates by expressing confidence about the importance of the task and the team's ability to accomplish it.</li> </ul>	<p><input type="checkbox"/> Supports a constructive team climate by doing <b><u>any one of the following</u></b>:</p> <ul style="list-style-type: none"> <li>• Treats team members respectfully by being polite and constructive in communication.</li> <li>• Uses positive vocal or written tone, facial expressions, and/or body language to convey a positive attitude about the team and its work.</li> <li>• Motivates teammates by expressing confidence about the importance of the task and the team's ability to accomplish it.</li> </ul>	<p><input type="checkbox"/> Supports a constructive team climate by doing <b><u>none of the following</u></b>:</p> <ul style="list-style-type: none"> <li>• Treats team members respectfully by being polite and constructive in communication.</li> <li>• Uses positive vocal or written tone, facial expressions, and/or body language to convey a positive attitude about the team and its work.</li> <li>• Motivates teammates by expressing confidence about the importance of the task and the team's ability to accomplish it.</li> </ul>
<p><b>Responds to conflict</b></p>	<p><input type="checkbox"/> Identifies and acknowledges conflict and acknowledges that relationships can be damaged. Seeks to restore relationships.</p>	<p><input type="checkbox"/> Identifies and acknowledges conflict and acknowledges that relationships can be damaged.</p>	<p><input type="checkbox"/> Identifies and acknowledges conflict but will not acknowledge that relationships can be damaged.</p>	<p><input type="checkbox"/> Will not acknowledge that conflict has occurred or that relationships can be damaged.</p>

## Assessment Data Mathematical, Information and Computer Sciences

**Learning Outcome:** Students will be able to understand and create arguments supported by quantitative evidence, and they can clearly communicate those arguments in a variety of formats (Quantitative Reasoning).

### Outcome Measure:

Before 2022: Annual: Each student will participate in the ETS Proficiency Profile exam.

After 2022:

Annual: Each student will participate in the ETS Proficiency Profile exam.

Annual: MTH3083 Mathematical Probability and Statistics Signature Assignment (Math and Data Science Majors)

Alternating Year: ISS4014 Database and Web Signature Assignment (CS and IS Majors)

**Criteria for Success:** 90% of the students will be Marginal or Proficient at Level 2. Note that we dropped the criteria of success so that it is possible for the department to pass even if a single student misses the criteria.

### Aligned with DQP Learning Areas (circle one or more):

1. Specialized Knowledge
2. Broad Integrative Knowledge
3. Intellectual Skills/Core Competencies
4. Applied and Collaborative Learning, and
5. Civic and Global Learning

### Longitudinal Data:

ETS Proficiency Profile	Percentage of Students Marginal or Proficient								
	2012-13	2013-14	2014-15	2015-16	2016-17	2017-18	2018-19	2019-20	2020-21
ETS Proficiency Profile Level 2 Mathematics	100%	100%	100%	100%	92%	82%	95%	93%	81%

**Conclusions Drawn from Data:** Students are in general meeting our criteria. The variation often comes down to a single student because of small sample sizes. The Spring of 2021 was during COVID and students were exhausted by the time that they took the ETS exam, so this may explain the lower score for that year.

**Changes to be Made Based on Data:** None at this time. We will continue to monitor the results.

**Rubrics:** ETS Proficiency Profile (no rubric involved). New rubrics for signature assignments under development.

**Fermanian School of Business**  
**PLO #4 Assessment**  
**2020-2021**

**Learning Outcome:**

MICS PLO #9/FSB PLO #4: Formulate decisions informed by ethical values.

**Outcome Measure:**

The CAPSIM COMP-XM Management Ethics Simulation provides comparative data on how each student (and class) performs against all other students in the nation taking the applied simulation at the same time.

**Criteria for Success:**

Average score of all students will be above the 70<sup>th</sup> percentile on the national COMP-XM Ethics Module Results

**Aligned with DQP Learning Areas (circle one or more but not all five):**

1. Specialized Knowledge
2. Broad Integrative Knowledge
3. Intellectual Skills/Core Competencies
4. Applied and Collaborative Learning, and
5. Civic and Global Learning

**Longitudinal Data:**

Semester	N <sup>1</sup>	Ethics Module Results (%)
Spring 2016	59	54
Fall 2016	60	80
Spring 2017	68	83
Fall 2017	81	74
Spring 2018	56	77
Fall 2018	N/A	N/A
Spring 2019	N/A	N/A
Summer 2019	13	72
Fall 2019	60	74
Spring 2020	54	59
Summer 2020	N/A	N/A
Fall 2020	64	67
Spring 2021	70	61
Summer 2021	31	69

<sup>1</sup> Number of Students Completing Module

### **Conclusions Drawn from Data:**

The COMP-XM Ethics Module was implemented in Spring 2016. With an average score in the 54<sup>th</sup> percentile, the criteria for success was initially set at the 55<sup>th</sup> percentile. The criteria for success was raised to the 70<sup>th</sup> percentile beginning in Fall 2017 due to strong results in AY 2016-2017.

Data was not collected in Fall 2018 or Spring 2019 due to miscommunications regarding the simulation set-up. Due primarily to the fact that Summer 2020 term was fully remote (as a result of COVID-19), the Summer 2020 data is not reliable due to all students not completing all part of the simulation and related assignments or students not being fully prepared for the simulation and related assignments; therefore, no Summer 2020 data is included above. The criteria for success has been met for six of the eleven periods with data.

### **Changes to be Made Based on Data:**

Business ethics knowledge was recognized as an area needing improvement through the Peregrine comprehensive exit exam (PLO 1 – Business Ethics); however, the criteria for success was met for PLO 1 – Business Ethics in AY 19-20 and AY 20-21 (see Undergraduate Core PLO #1 Assessment Report). Beginning AY 21-22, the assessment for Ethics will be moved from MGT4088 to BUS4089. In addition, additional ethics content is being added to the BUS4089 course.

## Assessment Data Mathematical, Information and Computer Sciences

**Learning Outcome:** Students will understand the professional, ethical and social issues and responsibilities with the implementation and use of technology.

**Outcome Measure:** Alternating year: ISS3042 Signature Assignment. Note that the department is in the process of developing a broader set of measures.

**Criteria for Success:** 80% of the students should have an average score of at least 2.5 in each of the major areas.

**Aligned with DQP Learning Areas (circle one or more):**

1. Specialized Knowledge
2. Broad Integrative Knowledge
3. Intellectual Skills/Core Competencies
4. Applied and Collaborative Learning, and
5. Civic and Global Learning

**Longitudinal Data:**

	Percent of students with average at least 2.5
	<b>Fall 2020</b>
Rubric Score	62%

**Conclusions Drawn from Data:** The students did not meet our standards on this first assessment.

**Changes to be Made Based on Data:** We are in the process of constructing a set of module that will be embedded in several MICS classes and the intent that student will have multiple exposures to ethics related issues and case studies. Our hope is that this scaffolding will ultimately support stronger responses in this senior level course.

Ethics Rubric

	1	2	3	4	5
Question 1	Activity is found to be ethical and no other supporting information is provided.	Activity is found to be unethical, but the support for this behavior is limited and lacks an implied defined framework. Response is a simple, "we shouldn't do this" with a harsh feeling.	Activity is found to be unethical and is supported by an ethical framework (explicit or clearly implied with a deontology framework). Response is a reasoned "we should do this" but is still somewhat harsh response.	Activity is found to be unethical and is supported by an ethical framework (explicitly stating a deontology framework). Response is a reasoned "we should do this" but is tempered with keeping the issue private between the two people.	Activity is found to be unethical and is supported by an ethical framework (explicitly stating a deontology framework). Response is a reasoned "we should do this" but express a clear justification and is not overly reactive and is kept private.
Question 2	The response does not identify an ethical issue with system reliability and does not clearly apply an ethical framework. The reliability issue is more of inconvenience to users and does not create actual harm or violate a rule or law.	The response identifies an ethical issues or at least applies (clearly implied or explicitly) an ethical framework. But not both.	The response identifies an ethical issues and at least implies an appropriate ethical framework the correctly relates to the issues and contains a good explanation of why the framework applies to the issue.	The response identifies a clearly ethical issues and explicitly and correctly relates the issue to ethical framework along with explaining why the two are related.	The response identifies a clearly ethical issues and explicitly and correctly relates the issue to ethical framework along with explaining why the two are related. The response goes on to give examples of why issues is an ethical problem.

## Assessment Data Mathematical, Information and Computer Sciences

**Learning Outcome:** Information Systems graduates will be adequately prepared for entry into graduate school or jobs in the computing profession.

**Outcome Measure:** Annual: Require students to take the ETS Major Field Test in Computer Science as the mid-term exam for the capstone course, ISS4081, Senior Seminar in Information Systems. Note that we are in the process of changing this to the Peregrine Test and in 2017-18 piloted a collection of questions.

Annual: Internship supervisor evaluations

Every 5 Years: Alumni will be surveyed every five years. They will be asked at least the following questions:

1. If you have a job in Computer Science: On a scale of 1 to 5, 1 being outstanding and 5 being poor, how well do you think that the undergraduate Computer Science curriculum at PLNU prepared you for your work in the field?
2. If you are going to graduate school or went to graduate school: On a scale of 1 to 5, 1 being outstanding and 5 being poor, how well do you think that the undergraduate Computer Science curriculum at PLNU prepared you for graduate school?

**Criteria for Success:** ETS MFT: 50% of our students achieve above the 25<sup>th</sup> percentile on the exam.

Peregrine Test: 70% of students will score a 70% or higher on the exam (when there are national norms, this will be adjusted).

Internship Supervisor Evaluation: 80% of the students will score an average score of 4 or more in the following areas:

- Ability to learn
- Ability to problem solve
- Quality of work
- Initiative
- Responsibility
- Ability to work with others
- Relations with others
- Ability to use computing to solve problems

Alumni Survey: 75% of the respondents say they were well prepared or higher.

**Aligned with DQP Learning Areas (circle one or more):**

1. Specialized Knowledge
2. Broad Integrative Knowledge
3. Intellectual Skills/Core Competencies
4. Applied and Collaborative Learning, and
5. Civic and Global Learning

**Longitudinal Data:** ETS Major Field Test: Most recent 10 years of data.

Year	Overall Benchmark
2007-08	N
2008-09	Y
2009-10	N
2010-11	Y
2011-12	N
2012-13	N
2013-14	Y
2014-15	N/A
2015-16	N
2016-17	Y

\*Sample size too small to be given indicator scores.

\*ETS changed the CS exam in 2011-12.

Peregrine Exam:

	2017-18	2018-19	2019-20	2020-21
Percentage of students scoring 70% or higher	100%	N/A	N/A	N/A

\*Note that there were no Information Systems majors in Senior Seminar in 2018-19.

\*\*COVID-19 made it extremely difficult to hold our second pilot in the senior seminar (it would have been March 2020) and this complexity continued into 2020-21.

Internship Supervisor Evaluation:

\*Supervisors for small sample of students (2) didn't return reports.

\*\*COVID-19 year, it was a challenge to get supervisors to respond to the survey.

Alumni Data: In the spring of 2017, the department surveyed alumni who had graduated in the last 15 years. The survey is data used to inform the department's program review. Below are the components of the survey relevant to our assessment plan for information systems.

**How well did the undergraduate curriculum prepare you for:**

	Well or higher	OK	Poorly
Work in the field (if went into the field)	61.5%	23.1%	15.4%
Graduate school	100%	0%	0%

**Conclusions Drawn from Data:** ETS Results: We continue to evaluate if the ETS exam in computer science is the best measure or ability for computer information systems/information systems students. We are considering moving to the Peregrine exam in Business for these

students since our newly adopted IS curriculum has a larger business component and Peregrine will work with us to design IS questions.

Peregrine Results: The students met the benchmark in 2018, the year that we tested the first round of questions that were designed. There were no information systems students in senior seminar in 2019 so we have not revalidated the questions. Because of COVID-19 it was not possible to run the second pilot test of the questions in March/April 2020 and we encountered similar problems in the Spring of 2021. We hope to run our second pilot in the Spring of 2022.

Internship Supervisor Survey: We have just begun using this survey, but the preliminary results indicate that the supervisors believe that our student interns are well prepared. We have had some challenges getting supervisors to respond to the survey, we need to look at the instrument and see if we can simplify it and that is on the list of department assessment tasks for Fall 2021.

Alumni Survey: The program met the benchmark for those who went to graduate schools but missed the benchmark for those who went into industry. The majority of these students earned their degree before the Information Systems curriculum was significantly changed to include a more cohesive set of business coursework. It is expected that those changes will be reflected in an improvement in the next round of survey data.

**Changes to be Made Based on Data:** ETS Results: We have made curricular changes in the last few years to update our department coursework to align with new standards from the Association of Computing Machinery as well as to respond to assessment data. As part of this process we did a complete overhaul in the curriculum in this area. In 2015-16 we launched an updated IS curriculum in partnership with the School of Business. This increased the amount of business course work completed by these students. We determined that the ETS in CS and the ETS MFT in Business were not well suited for assessing these students. We have moved to using an evaluation from Peregrine, however we are having to work with them to design the questions. We are in the midst of that process. See our APC proposals for the specific descriptions of curricular changes made.

Survey: We expect to see changes in alumni survey results due to the significant changes made in the Information Systems curriculum. We need to modify this survey so that it is quicker and easier for internship supervisors to give us feedback.

**Rubric:** ETS: The ETS provides the data.

Peregrine: We are currently developing questions for Peregrine so scoring the exam by hand. Once we complete a few years of pilot testing, Peregrine plans on using our information to build an online test that is part of their testing suite.

Internship Supervisor Evaluation: This is a survey instrument so there is no rubric.

Alumni Survey: This is not rubric scored, but the data is tabulated.