

**Academic Assessment Report**  
**MS / Industrial Engineering**  
**June 1, 2022**

**Program Goals**

1. Prepare students for significant applications of and contributions to Industrial Engineering beyond graduation.
2. Produce projects and theses which meet high academic standards and constitute significant applications of and contributions to Industrial Engineering.

**Student Learning Outcomes (SLO)**

1. Students will make satisfactory progress toward the degree, preparing to write a thesis which meets high academic standards and constitutes a significant contribution to Industrial Engineering.
2. Thesis students will be prepared to write a thesis which meets high academic standards and constitutes a significant contribution to Industrial Engineering.
3. Thesis students will write a thesis which meets high academic standards and constitutes a significant contribution to Industrial Engineering.
4. Project students will present a project which meets high academic standards and constitutes a significant application of Industrial Engineering.
5. Coursework students will demonstrate achievement of select course outcomes.
6. Students will be able to communicate effectively.

**Assessment Process**

1. Timeline
  - a) Annual Graduate Student Academic Reviews submitted to the Graduate School by June 30
  - b) Thesis students present a master's thesis proposal approximately one semester before graduation.
  - c) Thesis students submit a master's thesis and defend it in the Comprehensive Exam.
  - d) Project students present a master's project in the Comprehensive Exam.
  - e) Coursework students answer questions related to select course outcomes in the Comprehensive Exam.
  - f) Assessment results and analysis presented at August faculty “retreat” to stimulate discussion about any program (or assessment process) changes
2. Means of assessment
  - a) SLO1 assessed annually (indirect and direct)
    - Cumulative GPA (desired level of achievement  $\geq 3.0$ )
    - Annual Graduate Student Academic Review by graduate coordinator in consultation with student advisor (desired level of achievement is “satisfactory”)

- b) SLO2 assessed with master's thesis proposal
    - Student self-assessment of preparation to write a thesis with respect to **Comprehension** (understanding literature), **Application** (problem solving), **Analysis and Synthesis** (support for generalizations, alternative solutions), and **Evaluation** (validity)
    - Thesis Committee members assessment of preparation to write a thesis...
  - c) SLO3 assessed with master's thesis defense (Comprehensive Exam)
    - Student self-assessment of having written a thesis which meets high academic standards and constitutes a significant contribution to Industrial Engineering with respect to...
    - Thesis Committee members assessment of having written a thesis...
  - d) SLO4 assessed with master's project presentation (Comprehensive Exam)
    - Student self-assessment of having presented a project which meets high academic standards and constitutes a significant application of Industrial Engineering
    - Advisory Committee assessment of having presented a project...
  - e) SLO5 assessed with master's coursework exam (Comprehensive Exam)
    - Student self-assessment of having achieved select course outcomes, on a scale from 1 (strongly disagree) to 5 (strongly agree)
    - Advisory committee members assessment of having achieved select course outcomes, on a scale from 1 (strongly disagree) to 5 (strongly agree)
  - f) SLO6 assessed with master's thesis proposal and Comprehensive Exam (master's thesis defense, master's project presentation, master's coursework exam)
    - Student self-assessment of effective communication
    - Committee members assessment of effective communication
3. Reported annually to the Dean: Assessment results and analysis, and any consequential program or assessment process changes

## Assessment Results

### 1. Annual Graduate Student Academic Reviews

**Table 1.** Academic Warning letters received from the Graduate School after following semesters

	2020	2021	2022
<b>fall</b>	1	0	0
<b>spring</b>	1	0	1

### 2. Master's Project Presentation, Thesis Proposal and Defense

Scores in Table 2 are averages of medians across Student, Chair and Member responses after the Master's Project Presentation, Thesis Proposal and Defense.

**Table 2.** The student has presented a project, is prepared to write or has written a thesis based on...

	<b>2020</b>	<b>2021</b>	<b>2022</b>
<b>Comprehension</b>	4.52	5.00	4.26
<b>Application</b>	4.68	5.00	4.22
<b>Analysis</b>	4.28	4.17	4.22
<b>Evaluation</b>	4.36	4.50	4.30

### 3. Master's Coursework Exam

Scores in Table 3 are averages of medians across Student, Chair and Member responses after the Master's Coursework Exam.

**Table 3.** The student has achieved select course outcomes

<b>2020</b>	<b>2021</b>	<b>2022</b>
4.00	4.33	4.5

### 4. Effective Communication

Scores in Table 4 are averages of medians across Student, Chair and Member responses after the Master's Coursework Exam, Project Presentation, Thesis Proposal and Defense.

**Table 4.** The student has demonstrated effective communication skills

<b>2020</b>	<b>2021</b>	<b>2022</b>
4.00	4.33	4.67

## Consequential Program Changes

### 2020

Faculty will discuss Summary of Comprehension, Application, Analysis & Synthesis, Evaluation, Master's Coursework Exam, and Effective Communication at August "retreat."

- Table 2. Significant improvements primarily in the areas of Comprehension (understanding literature), Application (problem solving), and Evaluation Analysis (validity) from 2019 to 2020. Analysis & Synthesis (support for generalizations, alternative solutions) failed to improve from 2019 to 2020.
  - Comprehension and Application are relative strengths; Analysis is a relative weakness.
- Table 3. Scores associated with the Master's Coursework Exam continued to drop.
- Table 4. Scores associated with Effective Communication continued to drop.

## 2021

Faculty will discuss consequential program changes during the faculty retreat in August based on the assessment results. The scores in Table 2 show a steady improvement. This is perhaps partially due to the fact that we are receiving more evaluations. The scores on Table 3 also show improvement suggesting that the coursework only students are doing better in the comprehensive exam. Table 4 score are stable which suggests consequential changes to the program may not be needed.

## 2022

Faculty will discuss consequential program changes at August “retreat.” Relative weakness among coursework students relates to the clear understanding of course materials.

### **Assessment Process Changes**

## 2020

Faculty will discuss consequential assessment process changes at August “retreat.” Although an updated assessment form was uploaded to the departmental web site and students, Chair and Members have been reminded to complete the form, the problem with missing answers to those questions was not completely resolved. A mandatory action could be initiated to resolve the problem.

## 2021

Faculty will discuss assessment process changes during the faculty retreat in August based on the assessment results. The graduate committee is planning to modify the comprehensive exam for coursework only MSIE students to create a more uniform exam that better assesses the knowledge the students gain during their studies.

## 2022

Faculty will discuss consequential assessment process changes at August “retreat.” An updated assessment form was uploaded to the departmental web site to resolve the problems with missing answers to those questions.