

# Annual Academic Assessment Report

## MS / Biological Engineering

September 12, 2023

The following summarize the assessment measures used for this report. Results of last three years (Fall 2020 – Spring 2023) after our Graduate Program Comprehensive Review in October 2019 are given below and discussed about the student learning outcomes.

1. *Graduating student cumulative GPA*: SLO-1
2. *Annual graduate student academic reviews and progress reports*: SLO-1
3. *Number of publications and conference*: SLO-4
4. *Proposal defense – MS thesis proposal*: SLO-2 and 4
5. *Final examination – MS thesis defense*: SLO-3 and 4
6. *Exit reviews*: all outcomes

### 1. Cumulative GPA

MS: SLO-1 – Progress toward the degree and preparation of conducting thesis research (*i.e.*, academic progress)

**Table 1** provides the cumulative GPA for all students graduating with MS degrees since 2020 (over the last 3 years). The data are given in chronological order of graduating term. The metric for success is for 100% students to achieve at least 3.0 cumulative GPA. According to the data in **Table 1**, we have achieved the stated criterion.

**Table 1. Cumulative GPA for graduating BENG students for 2020 – 2023.**

Student Count	Degree	Graduating Term	Cumulative GPA
1	MSMEPH	1199	3.906
2	MSBE	1209	3.357
3	MSBE	1209	3.667
4	MSBE	1213	3.520
5	MSBE	1213	3.760
6	MSBE	1219	3.520
7	MSBE	1223	4.00
8	MSBE	1223	4.00
9	MSBE	1226	4.00
10	MSBE	1226	3.760
11	MSBE	1229	3.771
12	MSBE	1233	3.893
13	MSBE	1233	3.604
14	MSENDY	1233	3.880
15	MSBE	1236	3.464

## 2. Annual Graduate Student Academic Reviews and Progress Reports

MS: SLO-1 – Progress toward the degree and preparation of conducting thesis research (*i.e.*, academic progress)

**Table 2** provides the results from the annual graduate student academic reviews and progress reports of BENG MS students for Fall 2022 – Spring 2023. The reports could not be collected for 2020 – 2022 due to the pandemic. Also, note that there are 2 additional MS students in ENDY whose annual reviews were done through the interdisciplinary program.

This form, administered by the UA Graduate School, provides for a rating of satisfactory or unsatisfactory. The metric for success is 100% of students to achieve a “satisfactory” outcome. According to the data in **Table 2**, all students achieved “satisfactory” outcomes. Hence, there appears to be no issues or concerns through review of this measure.

**Table 2. Annual graduate student academic reviews and progress reports for 2022 – 2023.**

Academic Year	Number “Satisfactory”	Number “Unsatisfactory”
2022 – 2023	4	0

## 3. Number of Publications and Conference Presentations

MS: SLO-4 – Communicate effectively (oral)

**Table 3** provides the number of peer-reviewed publications and conference presentations for all students in MS program since 2020 (over the last 3 years). The metric for success is for 100% students to present at least one presentation in international/national/state conferences and meetings before their graduations. 7 out of 15 (47%) graduating MS students since 2020 presented at least one presentation in international/national/state conferences and meetings or published at least one peer-reviewed articles. Several students could not fulfil the requirement due to the restrictions caused by the pandemic. Improvements will be made to achieve this measure by working with faculty.

**Table 3. Number of publications and conference presentations for BENG students for 2020 – 2023.**

Student Count	Degree	Graduating Term	Number of Peer-Reviewed Publications	Number of Conference Presentations
1	MS	Fall 2020	0	2
2	MS	Fall 2020	0	0
3	MS	Spring 2021	0	0
4	MS	Spring 2021	0	0
5	MS	Fall 2021	1	1
6	MS	Spring 2022	0	0
7	MS	Spring 2022	2	1

8	MS	Summer 2022	1	0
9	MS	Summer 2022	1	0
10	MS	Fall 2022	0	1
11	MS	Spring 2023	0	0
12	MS	Spring 2023	0	0
13	MS	Spring 2023	0	1
14	MS	Summer 2023	0	0
15	MS	Summer 2023	0	0

#### 4. Proposal Defense

MS: SLO-2 & 4 – Plan thesis research which meets high academic standards and constitutes a significant contribution to Biological Engineering (*i.e.*, understanding of field and contribution to new knowledge); communicate effectively (oral and writing)

**Tables 4** provides the students' performances in MS thesis proposal defenses since 2020 (over the last 3 years). The evaluation rubrics for thesis proposals, which were completed by the committee members, were supposed to be used to assess the student learning outcomes. However, rubrics of several graduating MS students were not collected, except two, during the pandemic; hence, verification of progress or success is accessed by the fact that the student graduated. All the students either graduated or scored an average score of  $\leq 3$  and passed the proposal defense. Hence, there appears to be no issues or concerns through review of this measure. However, improvements will be made for timely collections of rubrics by working with faculty.

**Table 4. Performance of students in MS thesis proposal defense for 2020 – 2023.**

Student Count	Term	Result	Evaluation Score (Average)
1	1199	Graduated	-
2	1209	Graduated	-
3	1209	Graduated	-
4	1213	Pass	1.05
5	1213	Pass	0.83
6	1219	Graduated	-
7	1223	Graduated	-
8	1223	Graduated	-
9	1226	Graduated	-
10	1226	Graduated	-
11	1229	Graduated	-
12	1233	Graduated	-
13	1233	Graduated	-
14	1233	Graduated	-
15	1236	Graduated	-

## 5. Final Examination: MS Thesis Defense

MS: SLO-3 & 4 – Write a thesis which meets high academic standards and constitutes a significant contribution to Biological Engineering (*i.e.*, understanding of field and contribution to new knowledge); communicate effectively (oral and writing)

**Tables 5** provides the students' performances in MS thesis defense since 2020 (over the last 3 years). All the students either graduated or scored an average score of 3 or less and passed the examination. Hence, there appears to be no issues or concerns through review of this measure. However, improvements will be made for timely collections of rubrics by working with faculty.

**Table 5. Performance of students in MS thesis defense for 2020 – 2023.**

Student Count	Degree	Result	Evaluation Score (Average)
1	MS	Graduated	-
2	MS	Graduated	-
3	MS	Graduated	-
4	MS	Pass	2.00
6	MS	Pass	1.00
9	MS	Pass	1.16
10	MS	Pass	2.08
11	MS	Graduated	-
12	MS	Graduated	-
13	MS	Graduated	-
14	MS	Graduated	-
15	MS	Graduated	-

## 6. Exit Review

MS: All outcomes

Exit reviews were not done during the pandemic and those for the graduating MS students in 2022-2023 term are currently being performed after the new department head joined in August 2023.

## **7. Conclusion**

Several assessment data, especially evaluation rubrics, were not collected during the pandemic, preventing accurate assessments of the student learning outcomes (SLO). However, based on the given assessment measures, even if they are not complete, it appears that SLO were met by the BENG graduate program at MS levels for 2020 – 2023. Future assessments will be strengthened through the timely implementation of the evaluation rubrics as well as the the graduate student exit reviews.

## **8. Program Changes**

Two new MS programs, *i.e.*, MSBE with non-thesis option and accelerated MSBE, were created to increase graduate student population, and submitted for approvals on September 11, 2023. MSBE with non-thesis option is to provide more options to graduate applicants and recruit more students with industry career paths and non-traditional students. Accelerated MSBE is to retain high-achieving BSBE students and provide them with an accelerated schedule to obtain their MSBE degree. If approved, the new programs will be offered from Fall 2024.

## **9. Assessment Process Changes**

Faculty will discuss consequential assessment process changes for the timely implementation and completion of the required assessments during faculty meetings.