Academic Assessment Plan
MS / Biological & Agricultural Engineering
June 1, 2015

Program Goals

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

Student Learning Outcomes (SLO)

1. Students will make satisfactory progress toward the completion of course requirements in preparation for conducting thesis research which constitutes a significant contribution to Biological Engineering,
2. Students will be prepared to plan thesis research which meets high academic standards and constitutes a significant contribution to Biological Engineering,
3. Students will write a thesis which meets high academic standards and constitutes a significant contribution to Biological Engineering, and
4. Students will be able to communicate effectively.

Process for Assessing Each SLO

1. Timeline:

    a. Annual Graduate Student Academic Reviews submitted to the Graduate School by June 30.
    b. Thesis Proposal after approximately one year of graduate study.
    c. Assessment results and analysis presented at Summer Faculty "Retreat" to stimulate discussion about any program (or assessment process) changes.

2. Means of assessment [and desired level of student achievement]:

    a. SLO-1: Assessed annually with student's coursework, Annual Graduate Student Academic Review, and Annual Progress Report, and by Exit Review by Department Head

        - Cumulative GPA [desired level of achievement ≥ 3.0]
        - Annual Progress Report by student and Annual Graduate Student Academic Review by Graduate Coordinator in consultation with student advisor [desired level of achievement is "satisfactory"]
        - Exit Review by Department Head [desired level of achievement is "satisfactory"]

    b. SLO-2: Assessed with Thesis Proposal and Exit Review

        - Student self-assessment of preparation to plan thesis research with respect to Comprehension (understanding literature), Design and Application (problem solving), Analysis and Synthesis (support for

generalizations; alternative solutions), and Evaluation (validity) [desired level of achievement is “agree or strongly agree” on closed-form assessments]
- Thesis Committee members’ assessment of preparation to plan thesis research with respect to Comprehension (understanding literature), Design and Application (problem solving), Analysis and Synthesis (support for generalizations; alternative solutions), and Evaluation (validity) [desired level of achievement is “agree or strongly agree” on closed-form assessments]
- Exit Review by Department Head [desired level of achievement is “satisfactory”]

c. SLO-3: Assessed with Thesis Defense, Research Publication, and Exit Review

- Student self-assessment of having written a thesis with respect to Comprehension (understanding literature), Design and Application (problem solving), Analysis and Synthesis (support for generalizations; alternative solutions), and Evaluation (validity) [desired level of achievement is “agree or strongly agree” on closed-form assessments]
- Thesis Committee members’ assessment of having written a thesis with respect to Comprehension (understanding literature), Design and Application (problem solving), Analysis and Synthesis (support for generalizations; alternative solutions), and Evaluation (validity) [desired level of achievement is “agree or strongly agree” on closed-form assessments]
- Preparation of research results for publications in professional journals or conference papers in professional meetings [desired level of achievement is a “submitted” journal paper or conference paper]
- Exit Review by Department Head [desired level of achievement is “satisfactory”]

d. SLO-4: Assessed with Thesis Proposal, Thesis Defense, Research Publication and/or Presentation, and Exit Review

- Student self-assessment of effective communication [desired level of achievement is “agree or strongly agree” on closed-form assessments]
- Thesis Committee members’ assessment of effective communication [desired level of achievement is “agree or strongly agree” on closed-form assessments]
- Presentation of research to local, regional, national, and/or international audiences through publications in professional journals or conference papers or abstracts in professional meetings [desired level of achievement is a “submitted” paper or abstract]
- Exit Review by Department Head [desired level of achievement is “satisfactory”]

3. Plans of assessment:

Student Learning Outcome	Data	Source	Collected
1 – To make satisfactory progress toward the degree, preparing academically to conduct thesis research which meets high academic standards and constitutes a significant contribution to Biological Engineering	Cumulative GPA	Department	Annually
	Annual progress report	Major professors	Annually (June 30)
	Exit review	Department Head	At the time the student completes all the degree requirements
2 – To be prepared to plan thesis research which meets high academic standards and constitutes a significant contribution to Biological Engineering	Rubric to be filled out at student's thesis proposal evaluation (see attached)	• Major professors and thesis committee members • Students	At student's thesis proposal evaluation
	Exit review	Department Head	At the time the student completes all the degree requirements
3 – To write a thesis which meets high academic standards and constitutes a significant contribution to Biological Engineering	Rubric to be filled out at student's thesis defense (see attached)	• Major professors and thesis committee members • Students	At student's thesis defense
	Exit review	Department Head	At the time the student completes all the degree requirements
4 – To be able to communicate effectively	Rubrics to be filled out at student's thesis proposal evaluation and thesis defense (see attached)	• Major professors and thesis committee members • Students	At student's thesis proposal evaluation and thesis defense
	Number of publications and conference presentations	Major professors	Annually (June 30)
	Exit review	Department Head	At the time the student completes all the degree requirements

Summary: ***Data to be collected***

- Graduate student academic reviews and progress reports (annual)
- Cumulative GPA (annual)
- Rubric to be filled out at student's thesis proposal evaluation (see attached)
- Rubric to be filled out at student's final examination (see attached)
- Number of journal publications and conference presentations (annual)
- Exit review by Department Head at the time the students complete all the degree requirements

4. Reported annually to the Dean: Assessment results and analysis, and any consequential program or assessment process changes

EVALUATION RUBRIC: THESIS PROPOSAL EVALUATION

Student name: _____ **Student ID**: _____

Completed by: _____ **Date**: _____

I/The student am/is prepared to plan a thesis research based upon:	Strongly agree = **1**	Agree = **2**	Neither agree nor disagree = **3**	Disagree = **4**	Strongly disagree = **5**	**N/A**
(a) Comprehension of the relevant literature						
(b) Design and application of research methods and/or tools to solve research problem						
(c) Analysis and support for generalizations or generation of alternative solutions						
(d) Evaluation and validation						
(e) Effective oral communication skills						
(f) Effective written communication skills						
Overall judgment						
Comments:						

- This evaluation rubric serves as a model for a "tool" that can be used by the student's advisory committee both as they prepare their students to meet program goals and SLO-2 and as they report on their success in required assessment reports. Details can be adjusted or fine-tuned by the Major Professors in consultation with advisory committee members to meet the nature of the student's area of research. Desired level of achievement on the evaluation rubric is "agree or strongly agree, *i.e.,* ≤ 2".

- **Instructions**:

  1. Major Professors and students should review and become familiar with the criteria in the evaluation tool, as a guide, prior to the preparation of a thesis research proposal.
  2. The rubric should be scored both by the Major Professors in consultation with advisory committee members and by the students at the time the first complete draft of the proposal is submitted.
  3. The feedback provided by the scored rubric should be discussed directly with the student.
  4. The completed rubric should be delivered to the Graduate Coordinator (or Department Head) for use as a valuable tool in graduate student learning outcomes assessment.
  5. The student should keep the rubric page(s) as feedback for thesis proposal development.

EVALUATION RUBRIC: THESIS DEFENSE

Student name: _____ **Student ID**: _____

Completed by: _____ **Date**: _____

I/The student write(s) a thesis based upon:	Strongly agree = **1**	Agree = **2**	Neither agree nor disagree = **3**	Disagree = **4**	Strongly disagree = **5**	**N/A**
(a) Comprehension of the relevant literature						
(b) Design and application of research methods and/or tools to solve research problem						
(c) Analysis and support for generalizations or generation of alternative solutions						
(d) Evaluation and validation						
(e) Effective oral communication skills						
(f) Effective written communication skills						
Overall judgment						

Comments:

- This evaluation rubric serves as a model for a "tool" that can be used by the student's advisory committee both as they prepare their students to meet program goals and SLO-3 and as they report on their success in required assessment reports. Details can be adjusted or fine-tuned by the Major Professors in consultation with advisory committee members to meet the nature of the student's area of research. Desired level of achievement on the evaluation rubric is "agree or strongly agree, *i.e.,* ≤ 2".

- **Instructions**:

  1. Major Professors and students should review and become familiar with the criteria in the evaluation tool, as a guide, prior to the preparation of a thesis defense.
  2. The rubric should be scored both by the Major Professors in consultation with advisory committee members and by the students at the time the thesis defense is completed.
  3. The feedback provided by the scored rubric should be discussed directly with the student.
  4. The completed rubric should be delivered to the Graduate Coordinator (or department head) for use as a valuable tool in graduate student learning outcomes assessment.
  5. The student should keep the rubric page(s) as feedback for thesis development.