Assessment Process Template:

Undergraduate Degree Programs

The campus is undergoing a systematic approach to collect assessment information for every degree program. An overview of the five steps to complete this process is listed directly below, and the following pages include the template.

Five steps to filling out the following assessment template:

1. **List** the intended student learning outcomes for the degree program (page 2).
    - What should students know if they complete the degree program?

2. **Explain** what assessment activity has taken place (page 3).
    - What did you learn from past assessment activities?
    - How did you use what you learned to affirm or improve the student experience?

3. **Identify** the questions the department wants to ask about the student outcomes and how the questions will be answered using direct and indirect assessment strategies (page 4).
    - Are the students learning what you want them to learn?
    - How will you know that your students are learning the program outcomes?
    - What information will you collect to better understand student learning?

4. **Describe** how assessment will be administered in the department/program (page 5).

5. **Map** the curriculum onto the student learning outcomes (page 6)
    - Where are the students learning the intended program outcomes?
    - What shared experiences do the students have outside of the curriculum?

For resources, please see the Assessment website, attend a workshop (see website for workshop details), or contact Staci Provezis, Assistant Provost for Assessment, at sprovez2@illinois.edu.

DUE: May 1, 2017

Identifying Information

School/College: Engineering
Undergraduate Degree/Major Program Name: Bioengineering
Faculty Director Contact/Title: Assessment Lead, Jenny Amos
Contact Information: **jamos@illinois.edu, 217-333-4212**

Step 1: Assessment Planning

What questions, issues, or concerns about student learning in the degree program do you want to address? Looking at your program's student learning outcomes write at ***least three questions*** you would like to pursue to learn more about student learning at the program level. Describe what information you need to answer the questions and the timeline it would take you to answer the question. While not every learning outcome needs to be assessed every year, all need to be assessed over a 5-8 year period. The expectation is for some assessment work to take place every year, such as collecting evidence, interpreting evidence, or implementing changes. Add more rows if needed.

Question 1:	*How are students developing teamwork skills across the curriculum?*	
	Student Learning Outcome:	5
	Sources/Methods for acquiring evidence:	*CATME data from courses*
	Timeline:	*2019-2020*
Question 2:	*The lack of a practical in junior level labs means students are not being challenged to perform without guidance. Would adding back in practical exams help?*	
	Student Learning Outcome:	6
	Sources/Methods for acquiring evidence:	Student work examples, student surveys
	Timeline:	*2020-2021*
Question 3:	*Overall, student performance in math is strong but there is a disparity between skills demonstrated when a student is explicitly asked to use an approach versus using it on their own (implicit). More work can be done to break this down and see what deficiencies exist.*	
	Student Learning Outcome:	1
	Sources/Methods for acquiring evidence:	Student work examples
	Timeline:	*2019-2021*

Step 2: Assessment administration in the department

1. **Who will lead the assessment work?**
   (identify an individual or team who will coordinate the implementation of the plan):
   Our department assigns a faculty member as the assessment lead. The current assessment lead is Jenny Amos. This role is assigned by the department head and works closely with the undergraduate administration to accomplish the goals of the program.

2. **How will assessment information be shared within the department/program?**
   (typically during an annual meeting of the program faculty and staff; note that at this meeting the program may want to review enrollment information, course progression, degree completion, and other structural features of the student experience in addition to the evidence about student learning):

   The Undergraduate Curriculum Committee is the primary audience for assessment, but at the 3-year point, all data and discussion is shared with the faculty at our annual retreat ahead of time to fuel discussion.

3. **What is the plan for production of an annual summary report?**
   (the annual summary report includes the materials that form the basis of discussion at the annual meeting of the program faculty and staff, along with any recommendations made after considering the student learning assessment information presented; a template will be provided to collect this information):

   The assessment lead and Undergraduate Curriculum Committee will be charged with providing the annual report for review by the department head. This information will be available to the faculty and discussed at a faculty meeting.

Step 3: Student Learning Outcomes

In this section, please list the program's student learning outcomes.

- Look to the campus student learning outcomes as a resource for program-level outcomes. Not all campus learning outcomes need to be present in the program outcomes, and a program may have more than one outcome under a campus outcome. The Learning Outcomes should represent what students are able to do or knows as a result of the program.

- Most programs have 3 to 5 learning goals. Space to list the program learning outcomes is available below; add rows as necessary.

Student Learning Outcomes

Bioengineering graduates will have:

1. an ability to identify, formulate, and solve complex engineering problems by applying principles of engineering, science, and mathematics

2. an ability to apply engineering design to produce solutions that meet specified needs with consideration of public health, safety, and welfare, as well as global, cultural, social, environmental, and economic factors
3. an ability to communicate effectively with a range of audiences
4. an ability to recognize ethical and professional responsibilities in engineering situations and make informed judgments, which must consider the impact of engineering solutions in global, economic, environmental, and societal contexts
5. an ability to function effectively on a team whose members together provide leadership, create a collaborative and inclusive environment, establish goals, plan tasks, and meet objectives
6. an ability to develop and conduct appropriate experimentation, analyze and interpret data, and use engineering judgment to draw conclusions
7. an ability to acquire and apply new knowledge as needed, using appropriate learning strategies.

Step 4: Undergraduate Degree Program Curriculum Mapping

This worksheet, or similar document, **must be included** with the submission of the program's assessment plan.

	Degree Program Courses	**1**	**2**	**3**	**4**	**5**	**6**	**7**
First year	**BIOE 120**				A			A
Second year	**BIOE 201**	A (F)	A (F)		A(F)	A (F)		
	BIOE 202			A (F)			A (F)	A (F)
	BIOE 205	A (F)						
	BIOE 206			A	A(F)			A (F)
	BIOE 220	R						
Third year	**BIOE 302**	M (F)		R (F)				
	BIOE 303						M (F)	
	BIOE 310						M (F)	
	BIOE 360	M (F)						
Senior year	**BIOE 414**	M (F)						
	BIOE 415				R	R	R	R
	BIOE 420	M					M	
	BIOE 435	M	M	M	M	M	M	R
	BIOE 436	M	M	M	M	M	M (F)	M
	BIOE 476			R	R	R	M	R

- **Learning Outcomes** – Enter the academic degree program learning outcomes identified in the assessment plan on the top row of the following chart. Feel free to add columns if the academic degree/major program has more than five learning goals.
- **Degree/Major Program Courses/Experiences** – List all degree requirements (in some cases co-curricular experiences may also be included if required by every student). Feel free to add rows as needed.
- Indicate with a check (X) where the course or learning experience contributes to each of the learning goals. Courses may contribute to multiple learning goals.

Legend: A= Attained R= Reinforced M= Mastered, (F) = Formal Feedback w Graded work and rubric

Step 5: Previous Assessment Activities

What use has your program made of assessment evidence (formally or informally collected) in the last 5 years? Please describe what actions (if any) that your program has taken in the last five years that responded to assessment evidence. The actions may include: any changes that impact the degree program, such as changes to curriculum, instruction strategies, or co-curricular activities (such as internships, study abroad) ***and*** any decision to continue a current practice that evidence shows is effective. Please also cite the evidence that informed your department's practice.

Table Student Outcomes Review Cycle

Item	**Frequency**	**Reviewers**
Collect data for analysis	Every 3 years (2012-2013, 2015-2016, 2018-2019)	Assessment Lead Directs Faculty to Collect
Assess data and Recommend Action Items	Every 3 years(2012-2013, 2015-2016, 2018-2019)	Assessment Lead and Curriculum committee
Evaluation	Annually at retreats	All faculty
Address concerns	Annually at retreats	All faculty
Action items	Annually at committee meetings	Curriculum committee

Updates and Changes since 2016

1) Emphasis on statistics in BIOE 202 has been implemented and we are watching upper level courses to see impact of those changes
2) We added in a new applied linear algebra and MATLAB programming course as a pilot course for sophomores. This course also contains modeling of systems. We are watching the students who

took this elective to see if it impacts their performance in courses where these skills apply. This course will be submitted to be a required course in 2020.

3) EAB confirmed that labs are a strength in the department and thinks that new labs space will be a benefit to students. The addition of multiple courses (BIOE 306, BIOE 435-436) teaching AutoCAD and 3D printing was due to feedback from EAB and alumni about important skills that we were lacking. In addition, sophomore and senior classes were taught basic project management skills for scheduling work and spreading work across a team.
4) Common rubrics for lab and project reports were used in all fall sophomore classes in Fall 2018 to emphasize importance of communication skills, notation, and preparation of data visualizations. This practice is being encouraged across more courses as well. CATME is used across the curriculum to assess teamwork in students.
5) The department has been discussing ways to make the curriculum more flexible in response to student feedback. Currently, more courses are in plans to be offered twice a year and there is discussion about removing tracks from the curriculum in favor of student generated options.
6) Due to the change in ABET Student Learning Outcomes, we re-evaluated our outcome assessment plan and performance indicators to ensure that we were still measuring relevant and helpful data from our courses as well as in full compliance with the new criteria. During summer 2018, the UG Curriculum Committee met and revised the performance indicators and curriculum map to assign outcome assessment to courses for fall according to the new rubrics. Fall 2018 and Spring 2019 assessments used the new rubrics for the first time.

<u>Summary of key findings from 2019</u>:

Summary for Outcome 1: Overall, student performance is strong but there is a disparity between skills demonstrated when a student is explicitly asked to use an approach versus using it on their own (implicit). More work can be done to break this down and see what deficiencies exist. In addition, BIOE 210 can now be added as an early feedback point for linear algebra.

Summary for Outcome 2: Overall, student performance is strong and increases across the curriculum as one would expect. Should check rubrics to ensure that assumptions and constraints are biologically relevant and alternatives are analyzed in detail.

Summary for Outcome 3: Overall, student performance is strong but rubrics should be stricter to determine specific deficiencies in communication. Also need to capture performances for multiple audiences and see how students tailor. Consider using same rubric across courses similar to teamwork assessment with CATME.