# 2019-20 Student Learning Assessment Report, Academic

| **Program:** | **Degree:** | **Department Head:** | **Submitted By:** | **Date Submitted:** |
|---|---|---|---|---|
| Biochemistry | Major | Lucas Tucker | Kevin Rhoads | 06/30/2020 |

**Mission:**

Our mission is to provide a curriculum and environment that enable students to achieve a level of knowledge of biochemistry appropriate for their chosen field and a liberal arts education. We provide students with the foundation in chemistry and biochemistry necessary for their pursuit of careers in industry, research, education, health professions, or other interdisciplinary fields. Our curriculum encourages active participation and critical understanding of subject matter and safety issues in both courses and laboratories. We strive to provide our faculty with career and research opportunities for their scholarly development and to provide the college and community with a resource of knowledge and professional contribution.

| **1. Major/Program Student Learning Outcomes** Students will be able to... | **2. Phase** |
|---|---|
| 1. Broad and focused content knowledge:<br><br>...demonstrate a comprehension of course material in the basic areas of the biochemistry discipline (analytical, inorganic, organic, and physical chemistry; cell biology, genetics, molecular and biology).<br><br>...demonstrate a comprehension of focused knowledge in biochemistry concerning the roles (pathways), structure, and function of biological macromolecules. | Planning<br><br>Collecting |

**3. Assessment Procedures** (Planning/ determining)

**Method: (ex. tests, presentations, research paper)**

Comprehension of chemical knowledge will be assessed at the end of multiple courses using ACS standardized exams. Our students should average above the national average on these exams.

Comprehension of course material will be indicated by completion with a final grade of C- or greater. This will indicate that the student is able to meet expected standards for the given course.

**Using a Sample of Students?**

Yes

**If yes, describe your sample.**

Biochemistry majors

**When does assessment occur?**

At the end of courses using ACS exams.

**How often does assessment occur?**

Annually

**Criteria** (How do you know students are achieving learning outcome?)

Comparison to ACS exam national statistics.

**4. Assessment Results**
(Collecting/ analyzing)

Unfortunately this learning goal could not be assessed for AY2019-2020. The American Chemical Society has strict rules regarding the administration of their examinations. Due to the necessity of remote administration of final exams during the spring semester, the ACS exams could not be given.

**Learning Outcome Met?**
(Based on Criteria)
Not assessed

| **1. Major/Program Student Learning Outcomes** Students will be able to... | **2. Phase** |
|---|---|
| 2. Safety knowledge and practice<br><br>...identify and follow the proper procedures and regulations for safe handling and use of chemicals and biological materials. | Planning<br><br>Collecting |

**3. Assessment Procedures** (Planning/ determining)
**Method: (ex. tests, presentations, research paper)**

Knowledge of proper safety procedures and policies will be assessed by completion of required chemical and biological safety training as well as completion of safety tables listing chemical hazards, personal protective equipment, and proper disposal information prior to beginning laboratory experiments.

Implementation of safety procedures and policies will be assessed by proper demonstration of these procedures and policies in the laboratory.

**Using a Sample of Students?**

No

**If yes, describe your sample.**

**When does assessment occur?**

At the end of the second semester of Organic chemistry laboratory.

**How often does assessment occur?**

Annually

**Criteria** (How do you know students are achieving learning outcome?)

80% of students will score 70% or better on this portion of the laboratory writeup.

**4. Assessment Results**
(Collecting/ analyzing)

Due to the remote learning in Spring 2020, this goal could not be evaluated.

**Learning Outcome Met?**

(Based on Criteria)
Not assessed

| **1. Major/Program Student Learning Outcomes** Students will be able to... | **2. Phase** |
|---|---|
| 3. Laboratory skills and competency<br><br>...demonstrate the ability to perform hands-on skills, techniques, and data analysis relevant to a chemical and/or biochemical laboratory.<br><br>...demonstrate an understanding of the theory behind and effectively use standard laboratory equipment and instrumentation to carry out experiments.<br><br>...demonstrate an understanding of experimental design including the identification of an objective, experimental plan, and execution of this plan. | Planning<br><br>Collecting |

**3. Assessment Procedures** (Planning/ determining)
**Method: (ex. tests, presentations, research paper)**

Laboratory skills and competency will be assessed by completing the required laboratory courses with a grade of C- or greater.

**Using a Sample of Students?**

No

**If yes, describe your sample.**

**When does assessment occur?**

Upon completion of CHEM429

**How often does assessment occur?**

Annually

**Criteria** (How do you know students are achieving learning outcome?)

The ability to understand, evaluate, and propose experiments will be assessed in CHEM 429. Successful completion will be indicated with a course grade of C- or greater.

**4. Assessment Results**
(Collecting/ analyzing)

Independent projects were scheduled and planned for, but because of the switch to completely online remote learning they were never actually conducted. The students picked and designed the experiment, but were not able to carry it out or analyze any results. The learning goal was not met, only 74% of the students enrolled in the course (n=19) scored a 70% or higher. It's worth noting that the execution and dissemination of the project make up a majority of the assessment for this assignment and it is very common for students learning (and grade) to increase throughout these parts of the project.

**Learning Outcome Met?**
(Based on Criteria)

No

| **1. Major/Program Student Learning Outcomes** Students will be able to... | **2. Phase** |
|---|---|
| 4. Communication skills<br><br>...clearly communicate chemical and/or biological concepts to lay persons, peers, and those more knowledgeable in the field.<br><br>...convey the result(s) of laboratory experiments and research with clarity and coherence through effective writing and oral communication skills. | Planning<br><br>Collecting |

**3. Assessment Procedures** (Planning/ determining)

**Method: (ex. tests, presentations, research paper)**

Communication of chemical and/or biological concepts to peers will be assessed through completion of CHEM 311 or BIOL 190 with a final grade of C- or greater.

The ability to communicate research concepts through writing will be assessed via a senior research paper in CHEM 426.

The ability to orally communicate research concepts will be assessed by presenting talks or poster presentations at internal and/or external venues.

**Using a Sample of Students?**

No

**If yes, describe your sample.**

**When does assessment occur?**

Upon completion of completion of CHEM 311 (or BIOL 190) and CHEM 426

**How often does assessment occur?**

Annually

**Criteria** (How do you know students are achieving learning outcome?)

Comprehension of course material will be indicated by completion with a final grade of C- or greater.

**4. Assessment Results**

(Collecting/ analyzing)

Of 15 students who took CHEM 311 in F19, all exceeded the metric of a C- or higher grade.
(10 were BICM and 5 were CHEM majors)

**Learning Outcome Met?**

(Based on Criteria)

Yes