



Student Learning Assessment Report, Academic

Report Year

2022-2023

Program

Biochemistry Major

Department Head

Lucas Tucker

Submitted By

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Previously Submitted Reports

2021-2022 Biochemistry Major

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.

Assessment

1. Major/Program Student Learning Outcomes

Student will be able to...

Broad and focused content knowledge:

...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).

...demonstrate a comprehension of focused knowledge in biochemistry concerning the roles (pathways), structure, and function of biological macromolecules.

2. Phase

Check all that apply

- Planning/ determining procedure
- Planning/ Redesigning based on past assessment
- Collecting/ analyzing assessment data
- Discussing/ using result
- Determining if Changes had an Impact on Student Learning
- Objective not assessed this year

3. Assessment Procedures (Planning/ determining)

Method: (ex. tests, presentations, research paper, describe the assessment course and student sample when it is applicable, etc.)

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.

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, please identify the sample size and course number when appropriate)

CHEM120 S23

ACS National Ave 2013 test =39

75 of 129 exceeded (58%)

Class ave. (129) = 44

Chem Major Ave.(3) = 40 (2 exceeded...1 did not)

Biochem Major Ave.(11) = 46 (7 exceeded...4 did not)

CHEM 220 S23

ACS National Ave 2018 test = 33.9

46 of 83 exceeded (55.4%)

Class ave. (83) = 35.9

Chem Major Ave.(8) = 33.0 (5 exceeded...3 did not)

Biochem Major Ave.(7) = 37.6 (4 exceeded...3 did not)

CHEM240 S23

ACS Inorganic Foundations 2016 National Mean = 34

13 of 21 met or exceeded (62%)

Class avg. (21) = 34

Chem Major avg. (7) = 29 (2 met or exceeded...5 did not)

Biochem Major avg.(9) = 37 (7 met or exceeded...2 did not)

(of the minors in the course (5), avg was 36, 4 met or exceeded, 1 did not.)

CHEM310 F22

ACS Thermodynamics 2013 National Mean = 27

8 of 13 exceeded (61%)

Class avg. (13) = 27.8

Chem Major avg. (8) = 28.3 (5 exceeded...3 did not)

Biochem Major avg.(5) = 27.0 (3 exceeded...2 did not)

Learning Outcome Met? (Based on Criteria)

Yes



Assessment

1. Major/Program Student Learning Outcomes

Student will be able to...

Safety knowledge and practice

...identify and follow the proper procedures and regulations for safe handling and use of chemicals and biological materials.

2. Phase

Check all that apply

- Planning/ determining procedure
- Planning/ Redesigning based on past assessment
- Collecting/ analyzing assessment data
- Discussing/ using result
- Determining if Changes had an Impact on Student Learning
- Objective not assessed this year

Assessment

1. Major/Program Student Learning Outcomes

Student will be able to...

Laboratory skills and competency

...demonstrate the ability to perform hands-on skills, techniques, and data analysis relevant to a chemical and/or biochemical laboratory.

...demonstrate an understanding of the theory behind and effectively use standard laboratory equipment and instrumentation to carry out experiments.

...demonstrate an understanding of experimental design including the identification of an objective, experimental plan, and execution of this plan.

2. Phase

Check all that apply

- Planning/ determining procedure
- Planning/ Redesigning based on past assessment
- Collecting/ analyzing assessment data
- Discussing/ using result
- Determining if Changes had an Impact on Student Learning
- Objective not assessed this year

3. Assessment Procedures (Planning/ determining)

Method: (ex. tests, presentations, research paper, describe the assessment course and student sample when it is applicable, etc.)

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

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, please identify the sample size and course number when appropriate)

S23: 7 students (3 Biochem, 4 Chem) and the grades were:

3 A (1 Biochem, 2 Chem)

3 A- (2 Biochem, 1 Chem)

1 B+ (Chem)

Learning Outcome Met? (Based on Criteria)

Yes

Assessment

1. Major/Program Student Learning Outcomes

Student will be able to...

Communication skills

...clearly communicate chemical and/or biological concepts to lay persons, peers, and those more knowledgeable in the field.

...convey the result(s) of laboratory experiments and research with clarity and coherence through effective writing and oral communication skills.

2. Phase

Check all that apply

- Planning/ determining procedure
- Planning/ Redesigning based on past assessment
- Collecting/ analyzing assessment data
- Discussing/ using result
- Determining if Changes had an Impact on Student Learning
- Objective not assessed this year

3. Assessment Procedures (Planning/ determining)

Method: (ex. tests, presentations, research paper, describe the assessment course and student sample when it is applicable, etc.)

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.

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, please identify the sample size and course number when appropriate)

F22

There were 3 BICM and 6 CHEM majors in CHEM 311. 7/9 of the students (3 BICM, 4 CHEM) met or exceeded this goal. Two students (both CHEM) did not.

S23

CHEM426 – Goal was met. Of the 8 students evaluated, 7 exceeded the standard for the overall course grade.

Two students did not meet the standard for the poster/research paper requirement.

Learning Outcome Met? (Based on Criteria)

Yes

Package History

Date	User	Action
7/3/2023 12:20:37 PM	Kevin Rhoads	Submitted 'Student Learning Assessment Report'
7/3/2023 12:21:14 PM	School of Science - Dean	Received
7/3/2023 12:21:14 PM	Institutional Effectiveness	Received
7/3/2023 12:21:14 PM	Lucas Tucker	Received
7/3/2023 12:21:14 PM	Provost and Senior Vice President	Received
7/3/2023 12:21:15 PM	School of Science - Asst. Dean	Received
7/3/2023 12:21:15 PM	Thomas Giarla	Received
7/3/2023 12:21:57 PM	Margaret Madden	Decision Approved
7/12/2023 9:31:04 AM	Lucas Tucker	Decision Approved