

Annual Assessment Report
Biological and Chemical Sciences Majors
2014

I. Executive Summary

For this current Assessment report the majors in Biological and Chemical Sciences (Biological and Chemical Sciences (BCS), Biology, Biochemistry and Molecular Biology (BMB), and Chemistry) will focus on how well we are fulfilling the overarching goals of the majors (see below for details). To do this we included a “reflective essay” assignment as part of the Comprehensive Examination for the Class of 2014. We found that the students feel that we are fulfilling our BCS goals and think that their relationships with professors are the most important aspect of their education. We added an internship requirement to each of our majors. Also, we made a change to the BMB major – we no longer require BIOL 119L Ecology and Evolution but now require CHEM 326 Biochemical Pathways to better prepare our students for careers in these fields. We proposed, and the Faculty approved, a new major in "Biological and Chemical Sciences" that has fewer requirements and that will allow for students, especially those interested in the new Education major, to more easily pursue a double major. Finally, we proposed that our current majors also be offered for the B.S. degree. These proposals were approved by the Faculty and will be sent off to the state for approval as soon as possible. The offering of the B.S. in these majors should be a strong admissions draw.

II. A summary of the group’s annual Assessment Review and Planning meeting

- A. On March 18, 2014 the BCS faculty (Chris Bailey, Kristina Blake, Lauren O’Neil, Jackie Schnurr) met from 12:30-1:30.
- B. We discussed the best metric to measure if our graduating seniors are actually learning what we hope from the BCS majors. We decided that the best way to determine this would be a reflective essay assignment portion of the comps outlining our BCS goals.
- C. We reviewed the goals and only made one change to the first goal (which discusses the integration on Biology and Chemistry, which is much less now that Chemistry majors aren’t required to take Biology)

III. The group’s plan for what it will focus on in the upcoming year

There are several things that we will work on in the current year:

- 1. Determining which classes should be at the 200-level. Although Biology underwent a major overhaul and changed 200-level courses to 100-level courses, some faculty have thought that this might not be working for all students. This analysis will be done by the Biology/BMB faculty early in the Fall 2014 semester so that any necessary changes will be brought to Curriculum Committee.
- 2. Determining the impact of the new Health Sciences major will have on the BCS majors. This will be ongoing and be done by all BCS faculty.

3. Determining if the BCS 301/403 senior capstone experience is working for both the students and the faculty. Currently only several faculty can actually teach in this sequence, which doesn't make it sustainable. This will be done early in the Fall 2014 semester so that changes (if necessary) will be brought to Curriculum Committee.
4. Updating the current Assessment Plan so that it reflects what we are currently doing. This needs to be done throughout the next year and should reflect the changes to #1 and #3.

IV. An updated Assessment Plan

This is a work in progress. However, the BCS mission and goals have not changed and are presented below.

The Major in Biological and Chemical Sciences

Mission of the Major

The major in biological and chemical sciences provides students the opportunity and the guidance to build for themselves a foundation in the fundamental areas of biology, the study of life, and chemistry, the study of matter, with particular emphasis on the areas integrating biology and chemistry. Students engage in active learning as they apply the scientific method towards understanding the natural world. Students think critically when evaluating data as well as issues related to biology and chemistry in society, and they learn to write and speak effectively about science and scientific issues. Students are prepared for a variety of careers as well as advanced study in graduate school or any of the health professions.

Goals

1. Provide students the opportunity and the guidance to learn the fundamental principles of biology and chemistry and how they integrate with each other.
2. Engage students in practicing the process of science – planning, executing, and evaluating.
3. Train students to communicate scientific work in a clear, coherent manner in both written and oral form.
4. Help students to understand the importance of diversity in the practice of science through collaborative learning where different perspectives are valued and evaluated.
5. Challenge students to think critically and quantitatively in evaluating data and to apply that skill to issues arising in the world around them, including ethical conflicts surrounding particular scientific theories, technologies, or applications.

Alignment of BCS goals with the Wells Academic Program Goals

Wells APG	BCS Goal				
	1	2	3	4	5
1					✓
2	✓	✓			
3			✓		
4				✓	
5					

6				✓	
7				✓	
8	✓	✓		✓	✓

III.A summary of the data used by the group

This is a copy of the reflective essay assignment, with the common responses under each question:

These questions address the major goals that we have for the BCS majors. We want to know how well we are fulfilling each goal, or if we are failing at any point. Please answer each question thoughtfully because we will use your responses to assess how well we are doing as a department.

- 1. List all the courses that you have taken as a BCS major. Would you say that these courses provided you with the opportunity and the guidance to learn the fundamental principles of biology and/or chemistry? How about how these two fields integrate with each other? Please explain, using examples when appropriate.*

All responses indicated that we taught the fundamentals of biology and chemistry, and that the fields were well integrated.

- 2. Identify a project or projects where you needed to practice the process of science – planning, executing, evaluating and communicating (in both writing and orally). Explain what you did, and how it helped you to develop as a scientist.*

All students identified an example of this occurring in the courses they took. Developmental Biology was mentioned twice; other courses mentioned were Genetics, Organic Chemistry II, Ecology, and BCS 403.

- 3. Was there ever a course (or courses) where you had to understand the importance of diversity in the practice of science through collaborative learning, where different perspectives were valued and evaluated? Please explain, citing examples as appropriate.*

Most students didn't specify a course but did use examples of group projects and discussions throughout their curriculum.

- 4. Do you think we challenged you to think critically and quantitatively in evaluating data, and to apply that skill to issues arising in the world around you, including ethical conflicts surrounding particular scientific theories, technologies, or applications? Please explain, citing examples as appropriate.*

Several students mentioned Molecular Biology using current events in the class. Science colloquiums were also mentioned, especially the student evaluation forms for BCS 301 and 403.

5. *Finally, is there anything else that you think that we did well throughout your time as a BCS student, or is there anything you expected to do/learn that you didn't? Please be honest so that we can change if necessary!*

The students had many different answers to these questions, but most mentioned the close relationships that they developed with the faculty as the best part of their education. As for things we could improve upon, most were not realistic. Changing the rotation of 300-level courses so that they are offered more frequently, as well as increasing our course offerings were mentioned most often.