

2018 Biological Sciences: Health Sciences Annual Assessment Report

I. Annual Assessment Meetings:

March 22, 2018 (1 hour)- The NMS faculty (including Professors Burwell, Elliott, and Stiadle) met to appoint point people for assessing each of the majors in the division; Professors Burwell and Elliott agreed to assess the Biological Sciences: Health Sciences major.

May 10, 2018 (1.5 hours)- Professors Burwell and Elliott met to familiarize Elliott with the previous year's Assessment Plan and Report (as she is new to the faculty this year) and assessment in general.

May 14, 2018 (30 minutes) - The Health Science Committee (Professors Burwell, Elliott, Gagnon, Markowitz, and Stiadle) met. Professor Burwell gave an update on the state of assessment and how Elliott and her would divide the work on writing this Report.

May 14, 2018 (1.5 hours) - Professor Elliott attended the workshop on assessment led by EPC.

May 23, 2018 (2 hours) - Professors Burwell and Elliott met to work on the assessment report and updating the assessment plan.

May 30 2018- Professor Markowitz worked with Professor Burwell on the HS assessment report over email.

II. Closing the Loop

The Health Science Committee agreed to work on the following points for the Biological Sciences: Health Sciences program during 2017-2018 academic year.

- 1. What was proposed:** Offer HS401 in the Fall. This would allow students who would like to continue with their thesis work and conduct primary research on the topic a chance to do so in the Spring. A career planning piece should be added to the course. Move the sharing component out of HS401 and make it part of the HS senior comprehensive. Students would present either in Science Colloquium or a joint HS/PSY poster session.
 - What was accomplished:** The senior seminar course (HS401) was offered in the Fall and was co-taught by Deb Gagnon and Lindsay Burwell. This course was held at the same time and location as the Psychology Senior Seminar course. Having HS401 in the Fall did benefit the students in a few ways that are discussed in the subsequent data analysis section. One downfall of the course is that it is currently 2 credits so, being conscious of student workload, no additional content was added. When HS401 becomes a 4 credit course additional material will be added and the career preparation component of our program will be reassessed.
- 2. What was proposed:** Students will also submit a reflective essay as part of the Biological Sciences: Health Sciences senior comps. This essay will be used by Health Science faculty to assess if the program is meeting its goals and objective.
 - What was accomplished:** This year Seniors in the Biological Sciences: Health Sciences completed the BCS senior comps and were prompted to comment specifically on the Health Science program. We decided this strategy of collecting Senior data made sense because the Health Science major is in BCS and many of the required courses are taught by BCS faculty that are not necessarily part of the Health Sciences. In addition to the Senior reflections, we also collected and analyzed the Introduction to Health Science (HS100) reflections. Feedback highlighted from these reflections

are described below in the examination of data section. This information will help us decide what measurable learning outcomes will be adjusted and addressed in the future.

3. **What was proposed:** Health Science faculty will continue to revise the Health Science program goals, with a focus on goals 4-6 and their objectives. The goals cannot be currently changed due to the major being under revision by NYSED.
 - Was not focused on this year since we lost one faculty member and two others were on sabbatical. We will talk about how to assess these goals in future assessments.
4. **What was proposed:** Additional measurable learning outcomes from across the Health Science curriculum (focus on Psychology and Sociology) will be added to the assessment plan.
 - Was also not focused on this year. This will be made a priority for the 2018-2019 assessment. We will specifically focus on adding Psychology and Sociology learning outcomes to 1.2.
5. **What was proposed:** Objective 1.3 will be revised and measurable learning outcomes added. 1.3 - Students will understand and appreciate the interconnections between healthcare and environmental practices.
 - **What was accomplished:** During HS100 students were asked to complete a case study “Streams of Coal or Streams of Death” to address Outcome 1.3b. Data from this learning outcome is described below.
6. **What was proposed:** In 18-19 the Introductory biology sequence will be changed. BIOL 130L will be offered in Fall and BIOL 114L changed to a 200-level course with BIOL 130L as a prerequisite. These changes are being made as students in BIOL 114L were not making appropriate progress due to the amount of material covered in Biol114L. Having Biol130L as a prerequisite will reduce the amount of material covered in Biol114L and allow students to have more successful learning outcomes. This change will be assessed in Spring 2019.
 - This change was just approved and will be going into effect starting next Fall. This change will be taken into account and incorporated when assessing future outcomes.

III. Examination of Data Collected for this year’s targeted learning outcomes:

1. **What was proposed:** Offer HS401 in the Fall. This would allow students who would like to continue with their thesis work and conduct primary research on the topic a chance to do so in the Spring. A career planning piece should be added to the course. Move the sharing component out of HS401 and make it part of the Health Science senior comprehensive. Students would present either in Science Colloquium or a joint Health Science/Psychology poster session.
 - **Data discussion:** It was determined that moving the Health Science to the Fall semester was beneficial for a number of reasons. 1. Six out of the nine seniors volunteered to present their theses in Science Colloquium. The three students that did not present finished their degrees early and were not enrolled in Wells classes in the Spring. 2. Two students used what they had learned while writing their thesis in subsequent research projects and work they did in the community. 3. During graduate school interviews students were asked about their theses and were able to orally defend the content of their research. This made the students unique applicants compared to students from other schools that were not required to write a thesis. If the thesis was completed

in the Spring they would not have been able to talk about their work during the interviews. Students really appreciated how the thesis work was broken up and how they were taught the peer review process (supported by student evaluations).

Once the course becomes 4 credits we would like to see two things change in HS401. 1. Make the presentation component necessary by giving the students the option to either present in Colloquium or during the Spring Psychology poster session. 2. Incorporate more career development into the course. This can include but is not limited to: creating a CV, personal statement, mock interviews, etc.

2. What was proposed: Students will also submit a reflective essay as part of the Biological Sciences: Health Sciences senior comps. This essay will be used by HS faculty to assess if the program is meeting its goals and objective.

- **Data Discussion:** Graduating students were asked to answer the BCS senior comprehensive questions (comps) with a focus on their Health Science major. The questions directly ask students about program goals 1 (prepare students with the knowledge and skills necessary to pursue a career with the health professions), 3 (train students to communicate both in written and oral form), 5 (educate students to think critically and use quantitative reasoning in evaluating data), and 6 (help students understand the importance of multiple perspectives in the health sciences). In their responses, students also touched on goal 2 (provide guidance in health profession career exploration). 7 of the 9 Health Science majors completed these comprehensive questions.

Of those 7, all agreed that their coursework in the health science major “provided [them] with the opportunity and the guidance to learn the fundamental principles of health science.” Students wrote that “Yes all [courses] provided me with a thorough understanding of the principles of health science” and “The Health Science program offers a well-rounded experience most beneficial to students entering into the medical professions. It prepares students who wish to find a career in mental health, veterinary science, human medicine and public health.”

Although the BCS comps do not ask directly about career preparation (goal 2), three of the students wrote about it. Two found that HS100: Intro to Health Professions was useful in making decisions about their careers. “My HS 100 class brought multiple speakers to talk about various health career options within the field and this was extremely helpful. It also guided us on writing professional school personal statements which will come in handy in the future.” One student decided to study infectious diseases and credits HS100 for this: “Intro to Health Professions, specifically helped me to decide to pursue this goal. ... Some of these speakers and assignments have helped me decide to pursue a career in public health studying infectious diseases. Other classes that have helped me make this decision include medicinal chemistry ... as well as microbiology.” One student “expected to do more professional development. I know that BCS senior seminar made a CV, but we did not in the Health Science senior seminar. I think this is a really important document to have because many of the people in both majors have similar goals in the end.”

6 of the 7 students provided examples of when they had to communicate in both oral and written forms. All of them mentioned the independent project in Professor Burwell's organic chemistry course where they design an experiment and "actually complete [their] research and present it both in lab reports and then orally to the class." All students mention oral presentation of results (in organic chemistry and other classes), but only one mentioned a poster.

All 7 students wrote about goal 5, often in conjunction with the independent projects and theses. But these were not the only examples; as one student wrote, "Every course within the sciences at Wells has taught me how to think quantitatively and critically in evaluating data at some point. I feel this is not only covered in mathematics but in each scientific class as well." Another student pointed to labs in Chem323L Biochemistry where "we also had to perform math calculations and use graphs after every experiment to obtain results." Goal 5 also includes students applying their knowledge of the health sciences to ethical conflicts in the field. 4 students spoke to this part of the goal. 1 "[could not] think of a single instance where we talked about ethical issues. I know it has been mentioned through the use of personalized medicine, but it has not been stress in many classes." The rest spoke of activities and experiences with ethics. For example, "Principles of sociology was very important to understanding how your personal ethics plays a role within the community and can be applied in any workplace." Another student took up ethical issues herself: a book "read in medicinal chemistry ... later became the inspiration for [her] senior thesis... where [she] discussed the hold that pharmaceutical companies have over oncology research." The third student wrote "that all of the biological, chemical, psychology, and sociology courses I took challenged me to think critically and quantitatively in evaluating data, and to apply that skill to issues arising in the world."

Goal 6 has students considering and valuing various perspectives in the health sciences. All 7 students gave examples of this from their coursework, with many writing extensively on the topic." On every science course I found that my classmates were from different backgrounds in terms of schooling, cultural backgrounds, political ideologies and ways of thinking. During all my courses I felt that I could compare and discuss with my classmates the material, this practice was often encouraged." "In every class that contained a lab, I worked with others and learned the importance of differing perspectives." "I experienced many classes in psychology and sociology departments that highlighted the importance of diversity in the practice of science through collaborative learning with the use of discussion. The different perspectives were valued and evaluated in academic readings and in media." "Classes such as ethics and sociology focus on diversity and how one topic can be viewed in many different ways by people." "Intro to health professions we had to read a book about the other types of medicine and how they treat their patients."

The Rural Health Immersion Program received special notice for "allowing me to interact with people from diverse backgrounds, including people from Wells and residents of Alexander Bay." 3 of the 7 students mentioned this Program. One student wrote that "the rural health internship among other experiences made what was being thought in most classes more relatable and valuable."

5. What was proposed: Objective 1.3 will be revised and measurable learning outcomes added. 1.3 Students will understand and appreciate the interconnections between healthcare and environmental practices.

- **Data discussion:** In the case study “Streams of Coal or Streams of Death” students had to analyze a health related issues that arose in a mining town. Throughout this case study students investigated how mining impacts both community and miners’ health. We discussed what role the Department of Public Health plays in these situations and what it takes to link an environmental concern to a pathological outcome. We also compared the health concerns of FRACKing to mining since it is a popular alternative energy source that impacts our area. To successfully reach learning outcome 1.3b 70% of the students should have received a C or higher on the case study analysis assignment. All but one student received above a C on the assignment (95% of the class was successful completing the learning outcome). The one student that was not successful did not complete the assignment

IV. Program Changes for the upcoming Year

1. Revise the Assessment Plan measurable learning outcomes. This year we would really like to focus on goal one since it was not completely fleshed out in the assessment plan.
 - a. Assess learning outcome 1.1: Students will understand and apply basic biological and chemical principles to health-related problems and issues
 - b. More learning outcomes will be incorporated from the Sociology and Psychology courses. Special attention will be given to learning outcome 1.2.
 - c. An assignment will be designed in Medicinal Chemistry (CHEM303) that will address learning outcome 1.3a Analyze the effect health care practices have on the environment and vice versa through case studies and real world scenarios. In this assignment students will investigate how drug synthesis and metabolism impacts the environment.
2. Based on student feedback in the Senior comps, a new Nutrition course will be developed and proposed for Spring 2019. A basic human nutrition course is a prerequisite for physical therapy, physician assistants, and nurse practitioner programs. Assignments from this course will support a variety of the learning outcomes and will be added to the assessment plan.

V. Action Plan for the Upcoming Year

In the coming year we will focus on fleshing out and assessing program **Goal 1:** Provide an interdisciplinary undergraduate program that prepares students with the knowledge and skills necessary to pursue a career within the health professions.

1. Professor Elliott and Professor Burwell will gather data to assess learning objective **1.1:** Students will understand and apply basic biological and chemical principles to health-related problems and issues, specifically for sub-objective **1.1-part b** (how students extrapolate and form conclusions from data in lab reports and assignments)

How Outcome is Measured	Measurement Tool	Success Criteria
Lab Reports in Chem213L; Biol310L	Answer Keys/Locally developed rubrics	70% received C or higher
Post lab questions in CHEM323L; Biol226L	Answer Keys/Locally developed rubrics	90% received C or higher

2. Sarah Markowitz will assess the final exam for PSY206 (Health Psychology) as a learning outcome for **1.2**: Students will understand the biological, psychological, and sociocultural factors that influence behavior, wellness, health, and healthcare.

How Outcome is Measured	Measurement Tool	Success Criteria
Final Exam PSY206	Locally developed rubric	90% receive C or higher

3. Lindsay Burwell will design a new assignment in CHEM303 (Medicinal Chemistry) to assess **1.3**: Students will understand and appreciate the interconnections between healthcare and environmental practices. **Part a**: Analyze the effect of health care practices on the environment and vice versa through case studies and real world scenarios.

How Outcome is Measured	Measurement Tool	Success Criteria
Case Study CHEM303	Locally developed rubrics	70% received C or higher