

## 2018 Biological Sciences: Health Sciences Assessment Plan

**1. Program Mission Statement:** The Biological Sciences: Health Science major provides students with a foundation in the health sciences and prepares them for a variety of health-related careers including medicine, veterinary science, physical therapy, and many of the allied health professions. Students learn to think critically when evaluating data and deliberating on ethical and justice issues related to the health sciences and society. A commitment to meeting and resolving health challenges is instilled. Students learn to communicate in both written and spoken form and to work collaboratively.

### 2. Program Goals

1. Provide an interdisciplinary undergraduate program that prepares students with the knowledge and skills necessary to pursue a career within the health professions.
2. Provide guidance in health profession career exploration.
3. Train students to communicate in a clear, coherent, and effective manner in both written and oral form.
4. Provide students with the knowledge and skills to advance personal and societal health and wellness and instill a commitment to meeting current and arising challenges in the healthcare field.
5. Educate students to develop technological skills, think critically, use quantitative reasoning in evaluating data related to health issues and healthcare delivery in their local and global community. This includes ethical conflicts surrounding particular medical theories, technologies, applications, and policies.
6. Help students to understand the importance of multiple perspectives in the health sciences through collaborative learning where different opinions are included, valued, respected, and considered.

Alignment of Health Sciences Goals with Wells Goals:

	Health Sciences Student Learning Goals					
Wells APG	1	2	3	4	5	6
Content 1				✓	✓	
Content 2				✓	✓	
Content 3	✓	✓	✓		✓	
Skills 1			✓	✓	✓	
Skills 2					✓	
Skills 3				✓	✓	
Skills 4				✓		✓
Skills 5		✓				
Skills 6					✓	✓

### 3. Learning Objectives (1.1, 1.2, etc.) and 4. Learning Outcomes (a, b, c, etc.)

**Goal 1.** Provide an interdisciplinary undergraduate program that prepares students with the knowledge and skills necessary to pursue a career within the health professions.

**1.1** Students will understand and apply basic biological and chemical principles to health-related problems and issues.

- a. Define and apply biological and chemical concepts on exams and assignments.
- b. Extrapolate and form conclusions from data in lab reports and assignments.

**1.2** Students will understand the biological, psychological, and sociocultural factors that influence behavior, wellness, health, and healthcare.

- a. Successfully complete core social science course(s) in the curriculum.
- b. Demonstrate an understanding of both individual and group differences in behavior in written assignments and exams.
- c. Describe and define social factors that influence behavior, the way we think about ourselves and others, as well as how we interact with others as healthcare practitioners through reflection papers, essays, and other written assignments.
- d. Demonstrate an understanding of the biological bases of behavior through relevant coursework in psychology (e.g., Neuropsychology, Health Psychology) and/or biology (e.g., Animal Behavior).

**1.3** Students will understand and appreciate the interconnections between healthcare and environmental practices.

- a. Analyze the effect of health care practices on the environment and vice versa through case studies and real world scenarios.
- b. Explain the impact of environmental conditions on an individual's and a community's health and wellness through case studies.

**Goal 2.** Provide guidance in health profession career exploration.

**2.1** Students understand the varieties and nature of various healthcare professions and assess the goodness-of-fit of these careers to their own personal and professional goals.

- a. Describe the responsibilities of various health professions.
- b. Write self-reflective essays on their individual attributes, strengths and weaknesses, and match to career choice.

**2.2** Students understand how various health professionals work together as a team to provide a system of healthcare to the individual and the community.

- a. Exposure to a wide variety of healthcare professionals who describe their own professional and personal paths, job requirements, and interactions with others in providing healthcare services to others (e.g., through RHIP; guests in HS 100 and a variety of other courses in the curriculum).
- b. Describe how various health professionals interact through written assignments and oral presentations.

**2.3** Students will understand the admissions requirements and process for their chosen health profession

- a. Design an academic training and professional/career action plan.
- b. Conduct inquisitive and thoughtful interviews with healthcare professionals.

**2.4** Students learn to act professionally, embrace diversity, and gain hands-on experience in a healthcare setting.

- a. Complete an experiential learning experience in the health sciences under the supervision of a healthcare professional.
- b. Students describe and reflect on their experiences through a paper, poster, and/or oral presentations.
- c. On-site supervisors evaluate interns for professionalism, adaptability, independence and collaboration, communication, etc.

**Goal 3.** Train students to communicate in a clear, coherent, and effective manner in both written and oral form.

**3.1** Students demonstrate effective written communication.

- a. Use, evaluate, and appropriately cite the primary literature in lab reports, papers, posters, and a senior thesis.
- b. Use appropriate writing styles in written assignments.
- c. Write and describe their own scientific work in lab reports.

- 3.2** Students demonstrate effective visual and oral communication to their peers, the Wells community, and the general public
- a. Present work in an oral presentation format that includes visual representations.
  - b. Present work visually and orally via a poster presentation format.
  - c. Convey ideas and participate constructively in classroom discussions.

**Goal 4.** Provide students with the knowledge and skills to advance personal and societal health and wellness and instill a commitment to meeting current and arising challenges in the healthcare field.

**4.1** Students understand the role of public health officials in community assessment and public education

- a. Conduct and analyze data from surveys on community healthcare challenges
- b. Design and create a Public Service Announcement for the Wells community

**4.2** Students analyze and propose solutions to current and arising healthcare challenges

- a. Write and present senior theses on healthcare topics
- b. Read case studies and analyze real world scenarios

**Goal 5.** Educate students to develop technological skills, think critically, use quantitative reasoning in evaluating data related to health issues and healthcare delivery in their local and global community. This includes ethical conflicts surrounding particular medical theories, technologies, applications, and policies.

**5.1** Students will develop an understanding for the ethical issues that surround particular technologies and applications.

- a. Consider the ethics of technologies by evaluating data and ideas presented in journal articles, case studies, and books.
- b. Review the current literature to write and present senior theses on healthcare topics.

**5.2** Students will learn new technologies and how they can be applied.

- a. Complete post-labs, lab reports, and presentations that require students' understanding of the technology.
- b. Complete quizzes on the use and applications of the technologies.

**5.3** Students will use statistical methods to effectively analyze data.

- a. Successfully complete a course in statistics.
- b. Make and evaluate graphs
- c. Complete assignments that analyze typical statistics problems involving both description and inference.
- b. Students identify and execute an individual statistics project using software

**Goal 6.** Help students to understand the importance of multiple perspectives through collaborative learning where different opinions are included, valued, respected, and considered.

**6.1** Students will understand cultural differences and multicultural perspectives.

- a. Students consider the ethics of health science issues in society through discussions of case studies, media depictions, and real world scenarios that explore opposing ethical viewpoints

**6.2** Students will learn to work collaboratively.

- a. Work in groups on papers, presentations, and lab experiments
- b. Provide constructive peer feedback on papers, projects, and presentations
- c. Work with people outside the Wells community
- d. Complete a health sciences internship

**6.3** Students will understand social stratification and access to resources that influence well-being.

- a. Students write reflective essays on course readings
- b. Complete projects within the social sciences.

**5. Means of Assessment of Outcomes**

Student work will be assessed by the faculty member(s) teaching the targeted courses. Faculty members will evaluate if the students learned what was expected, based on each assignment (paper, presentation, group work, etc). The “Data Location” for all assessment measurements are in “faculty files”.

<b>Goal #1. Provide an interdisciplinary undergraduate program that prepares students with the knowledge and skills necessary to pursue a career within the health professions.</b>				
<b>Objective</b>	<b>Outcome</b>	<b>How Outcome is Measured</b>	<b>Measurement Tool</b>	<b>Success Criteria</b>
1.1 Students will understand and apply basic biological and chemical principles to health-related problems and issues.	a. Define and apply biological and chemical concepts on exams and assignments.	Course Exams in Biol114L; Biol130L; Biol226L; Biol304; Biol330L; Biol331; Biol309 Biol310L; Biol312L; Chem 107; Chem 108 Chem 213; Chem 214; Chem 323; Chem 326	Answer Keys/Locally developed rubrics	70% received C or higher
		Case studies in Biol130L; Ebola and Influenza Case studies in HS100	Rubric/Answer Key	70% received C or higher
		Assignments in Biol226L	Answer Key	80% received C or higher
		Case studies in Chem323L, Chem326; Chem303,	Locally developed Rubric/Answer Key	90% received C or higher
	b. Extrapolate and form conclusions from data in lab reports and assignments.	Lab Reports in Biol114L; Biol130L; Biol330L; Chem213; Chem214; Chem323L	Answer Keys/Locally developed rubrics	70% received C or higher
		Post lab questions in Biol226L	Answer Keys/Locally developed rubrics	90% received C or higher

1.2 Students will understand the biological, psychological, and sociocultural factors that influence behavior, wellness, health, and healthcare.	a. Demonstrate an understanding of both individual and group differences in behavior in written assignments and exams.	Book papers in PSY206; Final Exam PSY206	Locally developed rubrics	90% receive a C of higher
	b. Describe and define social factors that influence behavior, the way we think about ourselves and others, as well as how we interact with others as healthcare practitioners through reflection papers, essays, and other written assignments.	Book papers in PSY206; Final Exam PSY206	Locally developed rubrics	90% receive a C of higher
	c. Demonstrate an understanding of the biological bases of behavior through relevant coursework in psychology (e.g., Neuropsychology, Introduction to Psychology, Biological Bases of Behavior) and/or biology (e.g., Animal Behavior).			
1.3 Students will understand and appreciate the interconnections between healthcare and environmental practices.	a. Analyze the effect of health care practices on the environment and vice versa through case studies and real world scenarios.	Case Study CHEM303	Rubric	70% received C or higher
	b. Explain the impact of environmental conditions on an individual's and a	Streams of Coal or Streams of Death Case Study in HS100	Answer Key	70% received C or higher

	community's health and wellness through case studies.			
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Objective	Outcome	How Outcome is Measured	Measurement Tool	Success Criteria
<b>Goal #2. Provide guidance in health profession career exploration.</b>				
2.1 Students understand the varieties and nature of various healthcare professions and assess the goodness-of-fit of these careers to their own personal and professional goals.	a. Describe the responsibilities of various health professions.	Professional Interviews in HS100	Locally developed rubrics	80% received C or higher
		Written summaries of health professional speaker presentations in HS100	Locally developed rubrics	80% received C or higher
	b. Write self-reflective essays on their individual attributes, strengths and weaknesses, and match to career choice.	9 Questions assignment in HS100	Locally developed rubrics	80% received C or higher
		Final Portfolio Question 1 and 2 in HS100	Locally developed rubrics	80% received C or higher
2.2 Students understand how various health professionals work together as a team to provide a system of healthcare to the individual and the community.	a. Exposure to a wide variety of healthcare professionals who describe their own professional and personal paths, job requirements, and interactions with others in providing healthcare services to others	Written summaries of health professional speaker presentations in HS100	Locally developed rubrics	80% received C or higher
		Community presentation in OCS285 Rural Health Immersion Program	Locally developed rubrics	85% received S
	b. Describe how health professionals interact through written assignments and oral presentations.	Professional Interviews in HS100 and OCS285 Rural Health Immersion Program	Locally developed rubrics	80% received C or higher

		Final Portfolio Question 1 in HS100	Locally developed rubrics	80% received C or higher
		Career Plan Question 1 in HS100	Locally developed rubrics	80% received C or higher
2.3 Students will understand the admissions requirements and process for their chosen health profession	a. Design an academic training and professional/career action plan.	Career Plan assignment and Final Portfolio Question 3 in HS100	Locally developed rubrics	80% received C or higher
	b. Conduct inquisitive and thoughtful interviews with healthcare professionals.	Professional Interviews in HS100 and OCS285 Rural Health Immersion Program	Locally developed rubrics	HS100- 80% received C or higher OCS285- 85% receive S
2.4 Students learn to act professionally, work with diverse others, and gain hands-on experience in a healthcare setting.	a. Complete an experiential learning experience in the health sciences under the supervision of a healthcare professional.	HS290/390 reflection papers and poster presentations	Locally developed rubrics	90% receive an S
		RHIP participation	Instructor observations	85% receive an S
	b. Students describe and reflect on their experiences through a paper, poster, and/or oral presentations.	RHIP pre and post survey	Locally developed rubric	85% receive an S
		RHIP community presentation	Locally developed rubric	85% receive an S
	c. Supervisors evaluate interns for professionalism, adaptability, independence, collaboration, communication, etc.			

**Goal 3. Train students to communicate in a clear, coherent, and effective manner in both written and oral form.**

<b>Objective</b>	<b>Outcome</b>	<b>How Outcome is Measured</b>	<b>Measurement Tool</b>	<b>Success Criteria</b>
3.1 Students will demonstrate effective written communication	a. Use, evaluate, and appropriately cite the primary literature in lab reports, papers, posters, and a senior thesis.  b. Use appropriate writing styles in written assignments.	HS401 Senior Thesis	Locally developed rubric	100% receive a C or higher
		Biol310L Independent project introduction section	Locally developed rubric	90% receive a C or higher
		Lab reports in Biol130L, Chem213L, Chem214L and Chem323L	Locally developed rubric	70% receive a C or higher
		BIOL 304L Species papers	Rubric	70% received C or higher
		BIOL 331 Topic summaries	Rubric	70% received C or higher
		BIOL 324L Literature reviews Research posters	Rubric	70% received C or higher
		Mini-review article CHEM326 and CHEM303	Rubric	70% of the students demonstrate a passing grade
		HS100 9 Questions	Locally developed rubric	70% receive a C or higher
		HS100 Final Portfolio Personal Statement	Locally developed rubric	70% receive a C or higher
		HS100 The Spirit Catches You and Henrietta Lacks Reflective Essays	Locally developed rubric	70% receive a C or higher
	c. Write and describe their own scientific work in lab reports	Lab reports in Biol130L, Chem213L, Chem214L and Chem323L	Locally developed rubric	70% receive a C or higher

3.2 Students demonstrate effective visual and oral communication to their peers, the Wells community, and the general public	a. Present work in an oral presentation format that includes visual representations.	RHIP Community Presentation	Locally developed rubric	85% receive an S
		HS401 Senior Thesis presentation	Locally developed rubric	100% receive a C or higher
		Bio310L Independent Project presentation	Locally developed rubric	80% receive a C or higher
		Oral presentations in Chem214L and Chem323L	Rubrics	70% of the students demonstrate a passing grade
	b. Present work visually and orally via a poster presentation format.	HS290/390 Poster presentations	Locally developed rubric	90% receive an S
		HS401 Senior Thesis Poster presentation	Locally developed rubric	100% receive a C or higher
		BIOL 324L Research posters	Rubric	70% received C or higher
	c. Convey ideas and participate constructively in classroom discussions.	HS100 Case Study, Henrietta Lacks, and The Spirit Catches You class discussions	Locally developed rubric	70% receive a C or higher
		Biol309 Journal Article discussions	Locally developed rubric	80% receive a C or higher

**Goal 4. Provide students with the knowledge and skills to advance personal and societal health and wellness and instill a commitment to meeting current and arising challenges in the healthcare field.**

Objective	Outcome	How Outcome is Measured	Measurement Tool	Success Criteria
4.1 Students understand the role of public health officials in community assessment and public education	a. Conduct and analyze data from community healthcare challenge surveys	RHIP Community Survey	Locally developed rubric	85% receive an S
	b. Create a Public Service Announcement for the Wells community	PSY206 PSA Assignment	Locally developed rubric	100% receive a passing grade: 35% A 55% B 10% C

4.2 Students analyze and propose solutions to current and arising healthcare challenges	a. Write and present senior theses on healthcare topics	HS401 Senior Thesis Paper and Presentation	Locally developed rubrics	100% receive a C or above
	b. Read case studies and analyze real world scenarios	HS100 Ebola, Influenza, and Coal Mining Case studies	Locally developed rubrics	70% receive a C or above
		RHIP Community Assessment Assignment	Locally developed rubrics	85% receive an S

**Goal 5. Educate students to develop technological skills, think critically, use quantitative reasoning in evaluating data related to health issues and healthcare delivery in their local and global community. This includes ethical conflicts surrounding particular medical theories, technologies, applications, and policies.**

Objective	Outcome	How Outcome is Measured	Measurement Tool	Success Criteria
5.1 Students will develop an understanding for the ethical issues that surround particular technologies and applications	a. Consider the ethics of technologies by evaluating data and ideas presented in journal articles, case studies, and books.	Reflection paper on the book "The Quest for the Cure" CHEM303	Rubric	70% receive a passing grade
		Exam Questions on Paper discussions CHEM323L	Answer Key	70% receive a passing grade
		BIOL 114L History presentations	Rubric	70% received C or higher
	b. Review the current literature to write and present theses on healthcare topics.	HS401 Senior Thesis	Locally Developed Rubric	100% receive a C or above
5.2 Students will learn new technologies and how they can be applied.	a. Complete post-lab questions lab reports, and presentations that are dependent on their understanding of the technology.	Biol226L Bioinformatics post lab	Answer Keys	90% receive a C or above
		Biol310L EnteroPluri post labs	Answer Keys	80% receive a C or above
		Post-lab Assignments in Chem213L +214L, Chem323L)	Answer Keys	70% of the students demonstrate a passing grade

		BIOL 331 Current event presentations	Rubric	70% received C or higher
	b. Complete quizzes on the use and applications of the technologies.	Biol226L homework assignments and test questions	Answer Keys	80% receive a C or above
5.3 Students will use statistical methods to effectively analyze data.	a. Make and evaluate graphs	Lab reports in Bio130L,, Biol310L, Chem213L, Chem214L, Chem323L	Locally Developed Rubric	70% receive a C or above
	b. Complete assignments that analyze typical statistics problems involving both description and inference	Assignments in MATH 151 and MATH 251	Answer keys Instructor evaluation of written and computational work.	70% received C or higher
	c. Students identify and execute an individual statistics project using software	Assignments in MATH 151 and MATH 251	Answer keys Instructor evaluation of written and computational work.	70% received C or higher

<b>Goal 6. Help students to understand the importance of multiple perspectives through collaborative learning where different opinions are included, valued, respected, and considered.</b>				
<b>Objective</b>	<b>Outcome</b>	<b>How Outcome is Measured</b>	<b>Measurement Tool</b>	<b>Success Criteria</b>
6.1 Students will understand cultural differences and multicultural perspectives.	a. Students consider the ethics of health science in society through discussions of case studies and real world scenarios that explore different ethical viewpoints	HS100 Reflection Papers	Locally developed rubrics	70% received C or higher
		BIOL 324L Zoo project	Rubric	70% received C or higher
6.2 Students will learn to work collaboratively.	a. Work in groups on papers, presentations, and lab experiments	Students work in pairs or groups on lab projects in Biol114L, Biol130L, Biol226L, Biol310L,,	Locally developed rubrics	70% received C or higher

		Biol330L, Biol304L, Chem107L, Chem108L, Chem213L, Chem214L, and Chem313L		
	b. Provide constructive peer feedback on papers, projects, and presentations	HS401 Peer reviews of senior theses	Locally developed rubrics	100% received C or higher
		Biol309 peer review of popular science article	Locally developed rubrics	80% received C or higher
		Peer feedback form submitted after presentations and projects in Chem214L, Chem323L, Chem326 and Chem303	Rubric	70% received a passing grade
	c. Students work with people outside the Wells community	HS290/390 internship reflection papers and posters	Locally developed rubrics	80% received C or higher
	d. complete a HS internship			

#### 6. How Assessment Data will be utilized.

HS faculty will meet at the end of each semester to assess the HS major in terms of meeting our stated goals, objectives, and outcomes. Each faculty member is responsible for assessing her or his own courses and reports on changes made to achieve better alignment with the major's goals, objectives, and outcomes. Each faculty member is expected to have learning objectives clearly stated on course syllabi to facilitate this. Contingent faculty will be provided with the major's assessment plan in order to develop their courses and align their syllabi with the major's mission, goals, learning objectives, and outcomes. HS faculty will examine the measurements for the particular objective(s) we chose as the focus of our assessment work for the year, and analyze what the data indicate. If needed, course, program, and assessment materials will be developed to improve student outcomes. HS faculty will also use data to discuss and choose which objectives to focus our assessment on in the following academic year.