

**Weber State University Five-Year Program Review  
Self-Study**

Cover Page

Department/Program: **Health Sciences Department**

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**Brief Introductory Statement**

The Department of Health Sciences (hereafter referred to as “the Department”), within the Ezekiel R. Dumke College of Health Professions (DCHP) at Weber State University (WSU), takes pride in the way it prepares students for health professional programs both within and outside the DCHP.

All courses taught by the Department are carefully designed to be objective based. These objectives allow us to outline what students need to learn, define the level of learning expected, verify that our content covers all necessary material, and assess students on their ability to successfully master each objective.

We use clearly stated objectives with measurable benchmarks for each of our courses and tie those objectives to our teaching and assessment.

For example, in our flagship HTHS 1110/1111 Integrated Human Anatomy & Physiology course, which covers two semesters, there are more than 200 learning objectives. Each of these objectives clearly defines the depth and breadth of the content to be covered by the student. Accompanying these objectives are learning activities, recorded video lectures, study guide sections, laboratory activities, and other learning materials like short videos and PowerPoint slides. These courses each cover 10 learning units, which are broken down into 10-15 individual learning objectives per unit. There is a low stakes quiz for each unit with questions covering each learning objective. There is a midterm exam covering the first five units and a final exam covering the last five units. The formative unit quizzes, as well as the summative exams, pull from an extensive bank of more than 4000 questions vetted over a decade of use. Our testing

software (ChiTester) allows us to assign questions to objectives and then give students a certain number of questions for each learning objective. This enables us to deliver a variety of questions but still cover each objective in a fair manner. We are also able to analyze performance at the objective level and make changes to our instruction as needed. We follow a similar pattern in our other courses and are currently working to bring consistency of format to all Department courses.

Recently, the Department set out to overhaul all our courses to provide open educational resources (OER) for each class. These efforts have saved our students more than \$500,000 to date and will continue to benefit students as we complete the task of converting all our commercially published materials to free, open-access content. Our initial analyses have revealed no significant decline in either course performance or content retention.

Our primary mission is to support the health professions programs in the college. Most DCHP programs have admissions committees that use student grades in HTHS 1110/1111 as a significant factor in their admissions decisions. Over 1700 students per year enroll in HTHS 1110/1111. Therefore, it is important to the Department faculty to keep our teaching and examination materials consistent across sections within a semester and even year-to-year, facilitating the admissions committees' job of selecting the most-prepared students for their programs.

Along with these consistently high standards for course materials, we have similarly high standards for our teaching. In internal, end-of-semester evaluations, Health Science faculty are consistently rated over 4.0 on a 5-point Likert scale for overall effectiveness, with many of the professors scoring higher than 4.5. Our faculty engage in professional development activities and maintain sharpness in their teaching regardless of their rank or tenure status. Three of the five faculty in the Department have been named DCHP Teacher of the Year. All faculty have doctorate degrees and all adjunct faculty hold at least a master's degree, with a couple of adjuncts holding doctorate degrees as well.

### **Standard A - Mission Statement**

The mission of the Department is to facilitate the foundational learning that empowers individuals to be successful health professionals. We are committed to providing experiences that promote hands-on learning, critical thinking, inter-professional collaboration, evidence-based problem solving, and ethical and compassionate patient care. Course experiences are provided in a variety of formats, at affordable costs, and with measurable learning outcomes to ensure opportunities for success among all student populations. Students completing the rigorous health science courses will enter their chosen health professions program with effective study habits and a solid foundation of how the human body works.

## **Standard B – Curriculum Map**

### Curriculum Map

Students who pass HTHS LS1110 receive four credit hours of General Education credit toward the Life Sciences Breadth Requirement. Students are required to take at least nine hours of Sciences with at least three hours of Physical Sciences and at least three hours of Life Sciences. Life Sciences Learning Outcomes 1 through 8 (LO1-LO8) are common to all courses carrying the LS designation for General Education in the Colleges of Science, Health Professions, Social and Behavioral Sciences, and Education. Learning Outcomes 9 through 13 (LO9-LO13) are tied to required courses for the Associate of Science in Health Sciences degree. The Measurable Learning Outcomes are listed below and in Standard C, Student Learning Outcomes and Assessment.

### Life Science Learning Outcomes

After completing the natural sciences general education requirements, students will demonstrate their understanding of general principles of science:

- Nature of science. Scientific knowledge is based on evidence that is repeatedly examined, and can change with new information. Scientific explanations differ fundamentally from those that are not scientific.
- Integration of science. All natural phenomena are interrelated and share basic organizational principles. Scientific explanations obtained from different disciplines should be cohesive and integrated.
- Science and society. The study of science provides explanations that have significant impact on society, including technological advancements, improvement of human life, and better understanding of human and other influences on the earth's environment.
- Problem solving and data analysis. Science relies on empirical data, and such data must be analyzed, interpreted, and generalized in a rigorous manner.

Students will demonstrate their understanding of the following characteristics of life:

- Levels of organization: All life shares an organization that is based on molecules and cells and extends to organisms and ecosystems.
- Metabolism and homeostasis: Living things obtain and use energy, and maintain homeostasis via organized chemical reactions known as metabolism.
- Genetics and evolution: Shared genetic processes and evolution by natural selection are universal features of all life.
- Ecological interactions: All organisms, including humans, interact with their environment and other living organisms.

**Curriculum Map**  
**Department of Health Sciences**

Core Courses in Department/Program (14 credit hours)	Department/Program Learning Outcomes												
	LO1	LO2	LO3	LO4	LO5	LO6	LO7	LO8	LO9	LO10	LO11	LO12	LO13
HTHS 1101 Medical Terminology (2)									I	I		M	M
HTHS LS1110 / 1111 Integrated Human Anatomy & Physiology with Lab (8)	E	E	E	E	M	M	E	I	M	I			
HTHS 2230 Introductory Pathophysiology (3)	M			M		M	M	E	M	M	E		
HTHS 2231 Introductory Pathophysiology Lab (1)									M	M	M		

Symbol Key: I= Introduced, E =Emphasized, M = Mastered

- LO1. Evaluate scientific and non-scientific explanations for phenomena. [4]
- LO2. Give examples of the integration of different scientific disciplines. [2]
- LO3. Explain interactions between science and society. [3]
- LO4. Employ problem solving and data analysis tools. [3]
- LO5. Classify levels of organization in humans. [2]
- LO6. Diagram the ways in which human bodies obtain and use energy at the system, cellular, and molecular levels. [4]
- LO7. Give examples of ways in which genetic processes and evolution act on the human body. [2]
- LO8. Cite the ecological interactions between humans and their environment, which affect human health. [2]
- LO9. Correlate anatomical structures with their physiological functions. [4]
- LO10. Explain how diseases disrupt anatomy and/or physiology. [4]
- LO11. Evaluate probable causes of disease, given a case study. [3]
- LO12. Recognize the meaning of medical words whether written or spoken. [1]
- LO13. Deconstruct the etymology of medical words. [3]

**Standard C - Student Learning Outcomes and Assessment**

Measurable Program Learning Outcomes

At the end of their study at WSU, students in this program will be able to:

- LO1. Evaluate evidence and draw scientific conclusions about natural phenomena. [4]\*
- LO2. Give examples of the integration of science across different disciplines. [2]
- LO3. Explain specific interactions between science and society. [3]
- LO4. Employ problem solving and data analysis tools. [3]
- LO5. Classify levels of organization in humans. [2]
- LO6. Diagram the ways in which human bodies obtain and use energy at the system, cellular, and molecular levels in an effort to maintain homeostasis. [4]
- LO7. Give examples of ways in which genetic processes and evolution act on the human body. [2]
- LO8. Cite the ecological interactions between humans and their environment, which affect human health. [2]

LO9. Correlate anatomical structures with their physiological functions. [4]

LO10. Explain how diseases disrupt anatomy and/or physiology. [4]

LO11. Evaluate probable causes of disease, given a case study. [3]

LO12. Recognize the meaning of medical words, whether written or spoken. [1]

LO13. Deconstruct the etymology of medical words. [3]

\*Numbers in brackets after each measurable learning objective indicate its Bloom's taxonomy level: 1. Remember; 2. Understand; 3. Apply; 4. Analyze; 5. Evaluate; 6. Create. As this is an Associate Degree program, Bloom's levels 1-4 are emphasized most in our curriculum.

### General Education Outcomes

This program supports General Education at WSU by offering Life Science credit for HTHS 1110. Learning outcomes LO1-LO8 are derived from the General Education Learning Outcomes established by WSU for Natural and Life Science courses. The Department works closely with the General Education Program, its Director (currently Leigh Shaw), as well as the General Education Improvement and Assessment Committee (GEIAC) and its Chair (currently Molly Sween) to ensure the Department's adherence to General Education guidelines and policies, as well as to offer support to the ever-changing General Education program.

For example, when the Signature Assignment was introduced as a General Education course requirement, the majority of Department faculty attended the various round table discussions and other meetings to help evaluate the Signature Assignment's implementation and effectiveness. We have made many adjustments to our Signature Assignment, as well as the assessment tools we use to evaluate it with our students. These steps and our final product have been offered to the General Education program for evaluation and use among other programs. Our current Signature Assignment incorporates all of the components recommended by the General Education program and has a grading rubric tied directly to each one. Students are asked to answer the big question, "How do I know that what I am telling the people I associate with is the truth?" by evaluating sources of information, exploring published literature, interpreting scientific findings, and conveying information in way that is logical and easy to understand. Approximately 1700 students took HTHS 1110 and completed the Signature Assignment in 2020, with more than 85% scoring at least a C grade or better. (See Appendix G for Evidence of Learning in General Education Life Science Learning Outcomes. See Appendix H for the Signature Assignment instructions and grading rubric.)

### Concurrent Enrollment

The Department offers four different courses as concurrent enrollment (CE) to high schools extending from Provo to Logan. The CE sections of HTHS 1101, Medical Terminology, have annual enrollments of about 1100 students. HTHS 1110 and 1111 have approximately 220 CE students in each class every year. HTHS 1120, Case Studies in Health Sciences, sees about 800 annual CE students. Our CE student numbers have steadily increased over the last five years.

We work closely with the director and staff of the CE Program (currently Beth Rhoades and Nicole Butler) to verify we are following protocols and providing educational experiences that are meaningful and appropriate for the high school population. The pass rate among high school students taking our courses as CE classes meets or exceeds the pass rates in our campus-

based or online sections of the same class. We are careful to keep the CE sections of our classes as close to the campus-based and online versions of the course as possible. We have enjoyed healthy relationships with more than 40 high school-based faculty who teach these courses at 31 different high schools or secondary education institutions.

In 2020, Utah State University (USU) exercised their first right of refusal and informed the high schools in Logan that they would be offering CE sections of Medical Terminology. After a few frustrating months of trying to work with the USU faculty, the faculty from Logan area high schools appealed the decision to the state board, stating that the product provided by the Department was far superior to USU's proposed class. The decision was made to allow us to continue providing the CE option for Logan-area high schools, based on our excellent curriculum and solid relationships with CE faculty.

### Interdisciplinary Collaboration

HHS 1120, Case Studies in Health Sciences

This course introduces the interdisciplinary nature of healthcare through twelve medical case studies. Each case is written as a patient story and each story follows the patient through symptoms, diagnosis, and treatment. Throughout each case study, the health professionals are presented as working together as a team. At the conclusion of each case, students are directed to a webpage that links to information about each health profession. This page allows students to explore education requirements, job conditions, expected salary, job outlook, and so forth.

This course is taught to WSU students, both face-to-face and online, as well as to CE students in 27 high schools throughout the state of Utah. A recent study assessed the impact of this course on secondary students on 1) knowledge of the different roles of healthcare professionals, and 2) students' self-reported knowledge of the responsibilities of different members of a healthcare team. Paired-samples t-tests found significant improvement in both measures from pre-course to post-course.

As an additional component of the course, various faculty from WSU's DCHP guest-lecture in this course throughout the semester. For example, faculty from Radiology lecture on imaging and ACL tears, Respiratory Therapy faculty lecture on asthma, Nursing faculty lecture on cancers and meningitis, and Medical Laboratory Science faculty lecture on laboratory diagnosis of leukemias, etc. These in-class lectures are recorded and posted on Canvas for online and CE students. The guest lectures add another interdisciplinary healthcare component to the course as students are able to see the important roles of each healthcare field in patient care.

In addition to Case Studies in Health Sciences, two Department faculty work with professors from other disciplines to provide content in other DCHP courses and develop new courses. Currently, Dr. Jim Hutchins teaches an Immunology of COVID-19 course with Dr. Matt Nichalaou from Medical Laboratory Sciences, and Dr Marv Orrock teaches Pharmacology courses for the Doctorate of Nurse Practitioner Studies program.

### Five-year Assessment Summary

The results of the self-study and site visits from 2015 were overall very positive. A few areas of needed improvement were identified. The previous Department Chair undoubtedly addressed

many of the issues that were brought to light by the review; however, he did not leave documentation of such when he left WSU less than two years ago. Regardless, the steps taken to address the concerns and deficiencies identified in that report are summarized in Standard H.

Data from annual assessments or ongoing efforts to evaluate and improve student performance, teaching, response to input from outside parties, etc., is lacking for 2015-2019. Since 2019, we have worked to evaluate the effectiveness of our courses by examining quiz and exam data from the past and comparing it with quiz and exam data generated since we completely overhauled our course content in HTHS 1110 and HTHS 1111, as well as with HTHS 1101 and 2230/2231. The changes forced upon us by the COVID-19 pandemic have also contributed to our desire to evaluate our courses and compare them to previous years.

The results of these evaluations have revealed that our HTHS 1101 course is tracking well with previous semesters. HTHS 1110 and 1111 have experienced a slight decrease in overall student performance (1-2% overall drop in end of semester scores). This was discovered in Summer and Fall semesters of 2020. We were able to compensate for this change in overall grades and grade distribution by applying a 1-2% curve for those semesters. We then adjusted the weighting of grades in these courses, beginning with Spring 2021, and worked to eliminate problematic questions that may have brought down midterm and final exam scores. We will know the results of these adjustments at the end of the current semester.

Similar findings were seen in HTHS 2230 and similar approaches were taken to correct for the decrease in grades and shifted grade distribution by applying a 1% curve to Fall 2020 courses and improving midterm and final exam questions.

It is challenging to truly assess the root cause of the decrease in grades over the last few semesters. Many students who would choose to be on-campus have been forced into online learning. With the normal differences we see between online and on campus grades (on-campus students tend to score at least 2-3 points higher, on average, than online students), the decline is not unanticipated. The changes to day-to-day life that everyone has experienced due to COVID-19 may also significantly contribute to student performance. Finally, the changes in course materials, content delivery, testing protocols (Proctorio), lack of face-to-face interactions with faculty, lack of hands-on lab activities, and similar changes that have taken place over the last 14 months pose significant questions about the validity of assessment activities.

We anticipate having a nearly normal Fall Semester 2021. We look forward to the opportunity to more accurately compare student performance with semesters from before the pandemic. We hypothesize the changes we have made to the curriculum of our flagship courses will yield improvements in overall learning when the confounding factors associated with the pandemic are removed.

To date, there has been no Advisory Board tasked with providing input to the Department in an effort to improve what is taught and how students are evaluated. We are currently working to establish such a group, including representatives from the various DCHP health professions

programs, as well as outside healthcare entities, such as Intermountain Healthcare and MountainStar Healthcare, that can give us valuable feedback.

We meet annually with our partners in the CE community. These individuals comprise CE instructors as well as CTE Coordinators from local high schools and school districts. In the past, these meetings have been mostly informative for the CE instructors with little attempt to gather feedback and input from these individuals. We hope to change this dynamic and spend more time addressing the needs and concerns of our CE partners. This feedback will be collected, evaluated, and addressed via changes to our CE program.

### Assessment of Graduating Students

Students who wish to graduate with an Associate of Science degree in Health Sciences meet with an advisor from the DCPH Admissions Advisement Office to review transcript information (maintained in CatTracks) and graduation requirements. Students often confuse the requirements for an Associate degree (Arts or Science) in General Studies with the Associate of Science in Health Sciences degree; the Advisement Office helps students understand the differences between the two degrees and works with them to put together a schedule that will complete all of the requirements. Students wishing to graduate will declare Health Sciences as their major and complete the steps listed in their graduation sign-off, which includes applying for graduation and paying the application fee. Students who complete these steps but are short on credits or have anything else that might hold them up are contacted by Shauna Pitt or another representative from the Advisement Office to make sure they have completed all the requirements and necessary steps to graduate.

The Department itself does not participate in any kind of assessment of those graduating. There is no capstone course or project, as the degree is already rigorous, especially when compared to other Associate-level degrees. Department faculty and staff answer whatever questions they can and help students on a casual basis, but refer all formal requests for advisement to the DCHP Admissions Advising Office.

The Department has the principal function of teaching students the foundational information they need to advance to the various DCPH health professions programs. More than 70% of students who take classes in our Department do not go on to be admitted to a health professions program. Tracking where these students end up is difficult. Some pursue degrees outside of the DCHP, however, many either continue to apply for acceptance into their desired program without taking more courses or just stop attending classes at WSU altogether. The Admissions Advisement Office has increased its efforts to track these students and help them finish the Associate of Science in Health Sciences degree; however, the limited space in the existing DCHP programs continues to be the most significant limiting factor to students' progression toward a bachelor's degree.



## **Standard D - Academic Advising**

### Advising Strategy and Process

Academic advisement in the DCHP is provided by the Admissions Advisement Office, which is comprised of a Director, a Recruiter, four full-time Advisors, and an Administrative Specialist. The Advisors teach a First Year Experience course for health professions students, HTHS 1103, Introduction to Health Careers and Care in a Diverse Society. The Department Chair meets regularly with the Admissions Advisement Director, currently Eric Neff, to make sure the Advisors are aware of any changes or new course offerings, and have an opportunity to provide input. Their feedback and help is invaluable as they have a strong understanding of what the typical incoming health professions student needs as they begin our classes and work toward admittance into one of the competitive health professions programs.

### Effectiveness of Advising

The DCHP Admissions Advisement Office is very effective at helping students identify for which program they want to apply, understand the requirements of that program, and plan an academic schedule that will help them be best-positioned for successful application. The requirements of the programs can change frequently, so it is exceptionally important to have advisors who are aware and up-to-date on these changes, as they talk to students and help them plan their classes. The Advisement Office is physically located across the hall from our Department Chair office. Therefore, formal and informal conversations about the advising process occur regularly.

Since the last review, the Admissions Advisement Office has added three new positions. These individuals work closely with the Department Chair and the Director of the Advisement Office to reach out to students who are close to meeting the requirements for graduation and help them complete the few remaining classes or steps required to earn their AS degree. We are confident these efforts have contributed to the increasing number of graduates we have seen over the last 5 years.

Additionally, the Advisement Office provides a twice-yearly informational meeting, which typically draws 100 or more students. Representatives from all DCHP programs (including the Department) are on hand to explain their role in training students for a health professions career.

### Past Changes and Future Recommendations

Prior to the 2015 program review, the Admissions Advisement Office shifted from reporting to the Department Chair to reporting to the Dean of the College of Health Professions. This change was welcomed by all parties and has been effective in helping the head of advising to be aware of the needs of all programs in the college and to guide his staff to appropriately advise the thousands of students they see every year.

Future recommendations are tied closely to the goals and plans of the Department. As new courses are developed and a possible Bachelor's Degree finds its place in the Department, there will be increased demand on the Advisement Office as they will be able to help students pursue a different degree than what is currently available. Currently, the new HTHS 1104 course, as

well as changes taking place with respect to FYE-type courses, are changes the Advisement Office has been incorporating into what they do.

## **Standard E - Faculty**

### Programmatic/Departmental Teaching Standards

Including concurrent enrollment, we have about 2215 students per year enrolled in HTHS 1101, 1703 in HTHS 1110, 1178 in HTHS 1111, and 552 in HTHS 2230. For that reason, the Department expects that all faculty will use the same syllabus template, the same calendar (adjusted for days of the week the courses are taught), and the same set of teaching materials, formative learning activities, lab activities, summative quizzes and exams, and other resources. It is imperative that all courses, including concurrent enrollment, are the same in terms of structure, content, and grading schema.

All course materials are developed by the Department as a whole, and all policies are agreed to by the Department as a whole.

Each faculty member is given latitude to approach the material in their own individual way. Some faculty use a “sage on the stage” approach, while others prefer to be a “guide on the side.” Our experience is that, with advising, students will self-select those faculty members that best fit their personal learning style. We also offer a variety of presentation styles, as well as course delivery methodologies, to facilitate this process.

All faculty in the Department score significantly higher than 4.0 on a 5-point Likert scale on end of semester student evaluations. In order to receive tenure, DCHP faculty must score either “good” or “excellent” on teaching as judged by a peer review committee, the college’s promotion and tenure committee, and the Dean. There is no path to tenure that will “heal” a “satisfactory” or “poor” rating on this dimension. In the past five years, two Department faculty members have been promoted from Associate to Full Professor, one has undergone a successful post-tenure review, and two others are working toward tenure. The remaining professor is not on a tenure track but makes significant contributions to the Department and the DCHP as he also teaches for the Doctorate of Nurse Practitioner program.

### Faculty Qualifications

The Department currently employs six full time faculty, a 2/3-time lab manager, and ten adjunct faculty. All six full time faculty hold Doctoral degrees and the lab manager holds a Master of Science degree. Eight of the ten adjunct faculty have at least a Master’s degree; two of them have a Doctorate.

The full-time faculty bring extensive and diverse experience in a variety of clinical fields. We have two members, Travis Price and Kathy Newton, with educational backgrounds and clinical work experience in Medical Laboratory Science. Marv Orrock is a Doctorate-level Pharmacist with experience in a variety of pharmacology fields including commercial, research and development, and international service work. Justin Burr is a Doctorate-level Physical Therapist who continues to work as a practicing PT as time allows. Brad Winterton is a Veterinarian, has

extensive experience as an epidemiologist with the US Air Force, and has overseen a variety of human health projects in the US and abroad. Jim Hutchins is a Doctorate-level Neuroscientist with an extensive background in research, teaching, and administration at the medical school level. All faculty bring these experiences and backgrounds to the Department and help to diversify what we teach and how we approach it.

### Faculty Scholarship

All full time faculty are encouraged to be engaged in research activities, however our heavy teaching load and high student enrollment numbers act as a barrier to being able to commit extensive amounts of time to research. The projects that have been completed in the past five years focus on course development, the creation of open educational resources (OER) and work that Dr Hutchins has performed with undergraduate students using an animal model (zebra fish) to explore autism. Kathy Newton and Travis Price have both published articles in peer-reviewed journals during the last three years.

### Mentoring Activities

There is no formal mentoring system in the Department. Over the last two years, we have spent considerable amounts of time working in teams to revise our courses and the materials we use to teach our students. These teams of two often pair a more senior faculty member with one who is newer in an academic career, with the intent of sharing experiences and imparting wisdom. New faculty are encourage to attend live courses offered by other faculty or watch recorded videos done by senior faculty. We currently have three full professors with more than 40 years of combined teaching experience, two assistant professors, and a full time instructor. All faculty are encouraged, on a regular basis, to share teaching techniques and ideas for improving our instruction.

### Diversity of Faculty

The faculty are diverse in terms of background and experience, but we recognize a lack of gender and racial diversity. All full-time and adjunct faculty members, as well as Department staff, are white. Of the fifteen total faculty and staff members, five are female and ten are male. In our last search for a new professor, we gave the maximum amount of possible points for diversity among the applicants but ended up hiring a white male individual who was the clear frontrunner over all other applicants.

In the future, we would like to hire an individual who can add to the demographic diversity of our faculty. We believe this would be good for those employed by the Department as well as for our students and the college community. Despite the lack of diversity among the faculty and staff, all professors in our Department score very well on the end-of-semester student evaluation question that asks if the professor was consistently respectful of people's gender, religion, sexual orientation, age, and disabilities.

### Ongoing Review and Professional Development

Faculty and staff are evaluated on a yearly basis by the Department Chair, according to DCHP and WSU guidelines. In addition to the Departmental reviews, the DCHP has a thorough evaluation process for those seeking tenure as well as a post-tenure review process. Kathy

Newton and Travis Price have successfully completed the post-tenure review process required for promotion from associate to full professor in the last three years. Brad Winterton has completed the third year review of the tenure process as well as subsequent reviews. The Department Chair has addressed any deficiencies found in these evaluations with specific steps to be taken to correct the issues. The Department Chair maintains an open door policy with all Department faculty and staff, and welcomes and solicits feedback about his performance as Chair.

There are many opportunities for professional development. The Department specifically supports the financial costs associated with professional organization membership and has a system in place to help fund faculty and staff who wish to attend conferences or workshops. The Department even pays for journal article subscriptions by faculty who choose to continue to improve their knowledge through journal reading.

Outside of the Department, the DCHP has generous endowments from the Marriott, Mack, and Dumke families that support professional development. In addition to these college-specific funding sources, there are many grant opportunities from other organizations across campus, including the Office of Undergraduate Research, Academic Resource and Computing Committee, the Affordable Course Materials Committee, and the Research Scholarship and Professional Growth Committee. Faculty in the Department have benefitted from all of these committees over the last five years, bringing in more than \$50,000 to support a variety of professional growth and scholarship activities. Faculty are encouraged to continue to apply for grants to support continued professional development.

#### Use and Impact of High-Impact Educational Experiences

The recent overhaul of our flagship anatomy and physiology courses has brought about a meaningful improvement in the area of high-impact educational experiences. Prior to the changes, these courses centered around lecture-type teaching with hands-on laboratory experiences and frequent testing. The new design of the course still involves significant lecturing, but these lectures are now supplemented with more than 200 low-stakes, formative learning activities intended to push students beyond the bare minimum involvement with the material that we saw in the past. In addition to these small formative learning experiences, students are now allowed to use their course learning materials and their own notes to complete unit quizzes. This helps instructors and students both to assess their understanding of the content with the intent of revisiting the challenging concepts and objectives to improve long-term learning and retention, which are measured via proctored midterm and final exams.

In addition to changes made to our anatomy and physiology courses, we have held what we call Success in Health Sciences seminars intended to teach students how to best study for their health science classes. We have also redesigned how we approach laboratory experiences, shifting from a model that was heavy in lecture style teaching and computer based learning activities, to learning experiences that involve more small-group exploration of topics, guided demonstrations, dissections, and team collaboration. Many of these activities have been enhanced with new, cutting-edge technology, including augmented reality and 3D imaging. We have invested more than \$250,000 over the last 10 years to acquire new technology and plastinated cadaver models to enhance the hands-on learning our students receive.

In the last five years, we have introduced a “signature assignment” that involves an exploration of a health science-related topic, a critical evaluation of published literature (as well as other information sources), and a writing activity that pushes students to effectively communicate their findings. This assignment fulfills a requirement of all General Education courses and provides an opportunity for critical thinking and thoughtful evaluation of information.

### Evidence of Effective Instruction

All faculty are evaluated by students in each section they teach at the end of each semester. Full-time faculty in the Department consistently score well in each section, with scores for “overall effectiveness” above 4.0 out of 5 every semester (typically above 4.5 out of 5), with only a few exceptions. Adjunct faculty score similarly to the full-time faculty, despite teaching mostly evening or online sections of the courses. Only rarely are there complaints about faculty, whether adjunct or full-time and, more often than not, these complaints are about the course structure or content rather than the faculty member.

In addition to the student-generated evaluations, the Department consistently looks at quiz and exam scores and compares these scores across all faculty members and course sections. There is no significant difference between quiz or exam score averages between faculty members. There is a difference in overall performance between students who choose on-campus learning compared to those who are strictly online students. Online students average 2-3 percentage points lower on quizzes and exams. Score averages and overall course averages have been deemed acceptable by the Department, especially given the difficulty of the content and the number of students enrolled in these courses, however we consistently strive for ways to improve student performance and content comprehension.

## **Standard F – Program Support**

### *Support Staff, Administration, Facilities, Equipment, and Library*

#### Adequacy of Staff

The Department is supported by one Administrative Specialist (Chris Housley), as well as a 4/5-time Laboratory Manager (Pamela Silberman).

#### Ongoing Staff Development

Classified staff has the opportunity to develop administrative skills through a small Marriott Staff Development Grant set aside by the DCHP for special projects.

On-campus training includes a variety of courses found in “Training Tracker.” These courses cover a variety of topics, many of which are directly related to the job responsibilities of the staff. Chris and Pamela take advantage of these trainings regularly.

#### Adequacy of Administrative Support

Administrative staff is adequate for current needs. We experienced a gap in administrative support when our previous administrative assistant left and we had to hire a new one. The changes forced upon us by the pandemic (completely online teaching, not being able to work in

the office together, decrease in faculty and staff meetings, etc) also presented a number of challenges for our administrative support; however, we have done well considering these obstacles. Annual evaluations from faculty indicate that there is effective clerical support for the program and adequate delivery of educational objectives by administrative staff.

The addition of the Lab Manager position has had an incredibly positive impact on the Department as a whole. The way our Lab Manager has taken on the responsibilities of scheduling labs, updating content, managing lab instructors and aides, setting up and taking down labs, ordering supplies, and supervising the integration of lab content in our online and campus courses has been remarkable. The Lab Manager position is an absolute necessity in the Department. We continue to petition college administration to fully fund the position, as it is still half-supported by lab fees.

### Adequacy of Facilities and Equipment

The program regularly surveys students and faculty concerning the adequacy of equipment and supplies to endure sufficient preparation for class and laboratory sessions. Budgetary funds through assessed course fees are in place to replace and maintain equipment on an ongoing basis. Perkins funding is also available to increase equipment availability for the program. Course evaluations reveal no comments pertaining to deficient lab equipment.

About five years ago, the Department obtained space that was previously referred to as the DCHP Learning Resource Center. This space has been converted into overflow space for our labs. This additional space has been pivotal as we have expanded the small group-based, hands-on learning activities in our labs. Students are much more able to move around, spread out, and effectively work on a variety of learning activities with the new space. We are able to accommodate 34 students in each lab, a number that would have been impossible without the expansion. More students in each lab section allows us to offer more campus seats in both the class and lab portion of our courses.

Even with the lab expansion, space remains a considerable limitation to the Department. Students enroll in labs that run every two hours from 8:00am to 8:00pm almost every day of the week, yet every lab section is full and we end up turning away students interested in taking campus-based classes and labs.

We are also sorely lacking in space for our full-time and adjunct faculty, as well as for our student workers and laboratory staff. We do not have a single place where those without a designated office can prepare for classes or labs. We have eight full-time (or close to full-time) employees (the lab manager position is technically  $\frac{2}{3}$ -time, although she often works 40+ hours a week) but only seven Department offices. Repeated requests for an additional office have been denied by the DCHP Dean's office. There is currently no break room or conference space for the Department. Classroom space is also limited. We have been forced to cap enrollment numbers and teach in classrooms outside of our building to accommodate the demand for our classes. We offer a variety of evening and satellite-campus sections of our courses to accommodate the demand.

### Adequacy of Library Resources

The Stewart Library provides a broad range of information and resources in support of the Department's mission and goals. Services are provided at the Stewart Library on-campus and at the WSU-Davis Library/Information Commons. Additionally, all enrolled students, particularly off-campus students, can easily perform database searches and access other library services from virtually anywhere via internet connection.

Collections include print, electronic, and audio-visual resources, as well as access to an increasingly large number of research databases, full-text journals, and books. Day, evening, and weekend hours are maintained to accommodate patron needs on-site at both library locations. The Stewart Library is open 105 hours per week; the WSU-Davis library is open 45 hours per week. Off-campus access to resources and services is available 24/7 through the library website: <http://www.library.weber.edu>. The Librarian that currently services the DCHP, Jason Francis, has been great to work with and consistently offers his support and help.

### **Standard G - Relationships with External Communities**

#### Description of Role in External Communities

The Department does not currently have a defined role in the external community. This is mainly because the Department does not have an external accrediting agency or specific professional society – national, state, or local.

We have an excellent relationship with the University of Utah's (U of U's) Electroneurodiagnostics (END) program. We have been able to establish a partnership that allows students to receive WSU credits for the END training program, done at the U of U, that count toward a WSU Bachelor of Integrated Studies degree. This partnership has proven to be mutually beneficial as we are able to send well-prepared candidates to fill seats in the U of U program, while offering a pathway to a Bachelor's degree for U of U students who would otherwise receive only END certification.

The Department has also communicated with administrators at area technical colleges about a potential Bachelor of Applied Science in Health Sciences degree. Although this project is in the very early stages of development, the partnerships that have been created with leaders at these institutions are significant.

The faculty maintain contact with former graduates of the program informally. Numerous former students initiate contact with faculty when requesting updated letters of recommendation or permission to contact when changing jobs.

#### Summary of External Advisory Committee Minutes

The Department does not currently have an established External Advisory Committee.

#### Community and Graduate Success

The intention of the strong majority of Department students is to apply for admission into one of the various DCHP health professions programs. Those students who are accepted into these

programs enjoy high graduation rates and excellent job placement. The community impact of these graduates is tracked by the respective DCHP programs. Students obtaining Associate of Science degrees in Health Sciences do so to enhance their chances for admission to their health professions program and, therefore, do not have a specific role in healthcare or in the community.

## Standard H – Program Summary

### Results of Previous Program Reviews

The results of the previous self-study and site visit were overall very positive. Internal and external reviewers recognized many strengths and complimented the faculty and staff for their efforts and dedication to the students. Areas of improvement were identified as well.

<b>Problem Identified</b>	<b>Action Taken</b>	<b>Progress</b>
Mission statement verbiage issues	Based on the recommendations of the review committee, we have rewritten our mission statement.	The new mission statement seems to better embody our role in the DCHP and our commitment to student education.
Lack of physical space for labs	Shortly after the previous self-study and site visit, the Department was able to increase its lab space by acquiring what was previously the DCHP Learning Resource Center.	The added lab space has been extremely beneficial as it has allowed us to create more hands on, team-based learning activities. With more than 30 students in each lab, we were not previously able to spread students out and have enough room to engage in high-impact learning. We continue to increase these types of activities in the labs for each of our courses.
A need for anatomical models and technology	The Department increased its expenditure on models using grant monies as well as Department funds. New technologies (iPads with Visible Body software, large high-resolution touch screens) were also obtained through Perkins and ARCC grants.	The new anatomical models have improved our instruction of anatomy and physiology. The technology obtained has yet to be implemented due to the pandemic, but will be put into use in Fall semester 2021.
The ratio of instructors or lab aides to students is problematic	The Department hired more instructors and aides to teach labs. Wherever possible we employed a lab instructor and a lab aide for each lab.	The increase in instructors and especially lab aides has been very effective in increasing one on one instruction as well as team-based learning. The addition of a lab aide to each lab allows the instructor and the aide to work with separate groups of students doing different activities. This also increases the safety of lab activities.
High percentage of students not obtaining admission to a health profession programs	In conjunction with the DCHP Admissions Advisement Office, the Department has increased its efforts to track Health Science students who have taken classes in our program but have not declared some other major, which would indicate acceptance into a DCHP program.	With increasing enrollments in Department courses, the problem of acceptance into health profession programs has gotten worse, not better. We have been successful at increasing AS graduation numbers, but the increase in Health Science students has outpaced the increase in available spots in the various health profession programs.



	We have encouraged these students to finish the Associate of Science in Health Sciences degree.	
Lack of an external Advisory Committee	This issue was not addressed by the previous Department Chair, who left WSU in 2019. The changing of Department leadership and the COVID-19 pandemic limited the opportunities to establish an external Advisory Committee.	The current leadership will prioritize the establishment of an Advisory Committee that will include representation from programs in the DCHP, as well as community partners from local technical programs and healthcare systems.
Lack of space for Academic Advisors	Cubicle-style space was established for newly hired advisors.	While this does allow for a place for advisors to meet with students and make phone calls, privacy remains a concern. Advisors often speak with students about sensitive information. The need for increased privacy (separate offices) has been addressed with the DCHP Dean's office on several occasions.

Action Plan for Ongoing Assessment Based on Current Self-Study Findings

Action Plan for Evidence of Learning Related Findings

<b>Problem Identified</b>	<b>Action to Be Taken</b>
The Department lacks a formal procedure for the analysis of student learning effectiveness	The Department will establish a standard operating procedure (SOP) for evaluation of student learning and course effectiveness. Evaluation of quizzes, exams, and student learning activities is already taking place, but a formal and easy-to-understand method of compiling these data is needed.
There is no established standard for pass rates, exam scores or other measures of student success	In conjunction with national organizations for anatomy and physiology instruction (Human Anatomy and Physiology Society) as well as other programs similar to ours, we will establish a set of standards for pass rates and scores in our various classes. This will help us judge our effectiveness against something more than simply what we have seen in past semesters.

Action Plan for Staff, Administration, or Budgetary Findings

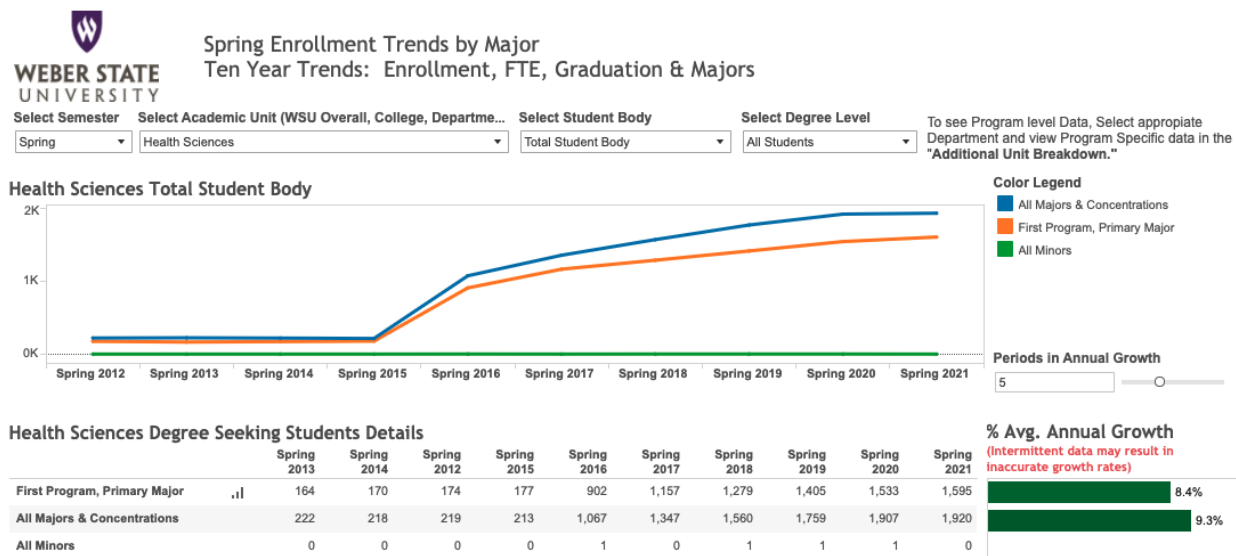
<b>Problem Identified</b>	<b>Action to Be Taken</b>
Student to faculty ratios are very high, well above the university average. It is not uncommon to find a single professor with more than 350 students in a semester.	The Department will continue to ask for additional resources to hire more faculty.
Lack of classroom space for instruction	The Department would like to offer more sections of our classes but with smaller enrollments. The lack of classroom space and faculty limit this possibility, forcing class sizes that often exceed 100 students. We will continue to approach the administration for additional faculty and new solutions to classroom availability issues.

<p>Lack of financial support for student-centered course materials projects</p>	<p>The Department is committed to reducing the costs of textbook and other course materials. The development of open educational resources (OER) is time consuming and most often requires off contract time. We will continue to explore funding options through the provost’s office, the Affordable Textbook Initiative as well as the Dean’s office.</p>
<p>Limitations in funding from Continuing Education for overload and satellite campus course offerings</p>	<p>The continuing education office has been very supportive of our expansive course offerings, but have expressed concern that we are reaching the limits to what it can fund. We have received support for our high course enrollments from the provost. We will work to make the funding permanent and continuous. We will also explore options for reducing the financial strain on continuing education through the possible hiring of an instructor position to help cover our course load, especially online courses.</p>

## APPENDICES

### Appendix A Student and Faculty Statistical Summary

<b>Health Sciences Department</b>	<b>2015-16</b>	<b>2016-17</b>	<b>2017-18</b>	<b>2018-19</b>	<b>2019-20</b>
<b>Student Credit Hours Total <sup>1</sup></b>	<b>14,017</b>	<b>15,365</b>	<b>17,024</b>	<b>17,688</b>	<b>18,073</b>
<b>Student FTE Total <sup>2</sup></b>	<b>467.23</b>	<b>512.17</b>	<b>567.47</b>	<b>589.60</b>	<b>602.43</b>
<b>Student Majors <sup>3</sup></b> other (2nd or 3rd majors)	888	1271	1449	1559	1781
<b>Program Graduates <sup>4</sup></b>					
Associate Degree	49	87	129	142	182
Bachelor Degree					
<b>Student Demographic Profile <sup>5</sup></b>					
Female	693	1028	1170	1250	1436
Male	195	243	279	309	345
<b>Faculty FTE Total <sup>6</sup></b>	<b>12.8</b>	<b>11.92</b>	<b>12.61</b>	<b>13.18</b>	n/a
Adjunct FTE	6.65	6.81	6.88	<b>7.43</b>	n/a
Contract FTE	6.15	5.11	5.73	5.75	n/a
<b>Student/Faculty Ratio <sup>7</sup></b>	<b>36.50</b>	<b>42.97</b>	<b>45.00</b>	<b>44.73</b>	n/a



The Department has experienced an average annual growth rate of 9.3% over the last ten years. This is compared to average annual growth rates of 1.9% for the DCHP and 1.5% for WSU over the same period.



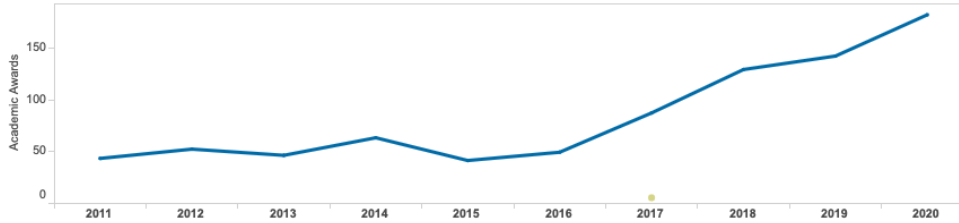
WEBER STATE UNIVERSITY

### 10 Academic Year Graduation Trends Ten Year Trends: Enrollment, FTE, Graduation & Majors

Select Academic Unit (WSU Overall, College, Department)  Select a Specific Major  Select Major or Minor  Select Data Layer

Not every department grants academic awards.

Health Sciences Academic Awards 10 Academic Year Trend (caution: Major filter will affect chart)



**Color Legend**  
■ Associate Degree  
■ Post Second. Cert/Dipl < 1 yr.

**Periods in Annual Growth**

Health Sciences Academic Award Details by Academic Year (caution: Major filter will affect chart)

	2011	2012	2013	2014	2015	2016	2017	2018	2019	2020
Post Second. Cert/Dipl < 1 yr.							5			
Associate Degree	43	52	46	63	41	49	87	129	142	182
Grand Total	43	52	46	63	41	49	92	129	142	182

**% Avg. Annual Growth**  
 (Intermittent data may result in inaccurate growth rates)



The number of graduates with an Associate of Science in Health Sciences degree has seen an average annual growth rate of 38.8% over the last ten years. This is compared to an average annual growth rate of graduates of 4.7% for DCHP and 3.2% for WSU over the same period.

**Appendix B**  
**Contract/Adjunct Faculty Profile**

Name	Gender	Race	Rank	Tenure Status	Highest Degree	Years of Teaching	Areas of Expertise
Justin Burr	M	W	Assistant Professor	Tenure track	DPT	2	Physical Therapy
James B Hutchins	M	W	Professor	Tenured	PhD	40	Neuroscience
Kathy Newton	F	W	Professor	Tenured	PhD	22	Health Behavior Change, Chronic Disease, Diabetes
Marv W Orrock	M	W	Instructor	Non-tenure track	PharmD	20	Pharmacology
Travis Price	M	W	Professor	Tenured	PhD	17	Medical Laboratory Sciences
Brad Winterton	M	W	Assistant Professor	Tenure track	DVM	5	Public Health, Epidemiology

Clayton Anderson	M	W	Adjunct Instructor	Adjunct	MS	8	Human Anatomy and Physiology
Carolee Calvin	F	W	Adjunct/lab Instructor	Adjunct	BEEd	12	Math, History, Health Sciences, Radiography
Cathryn Clayton	F	W	Adjunct Instructor	Adjunct	DMA, MS	10	Health Sciences, Respiratory Therapy
Jason Francis	M	W	Assistant Professor Health Science Librarian	Tenured	MLIS	5	Health Research Information Literacy
Frederick Henderson	M	W	Adjunct Instructor	Adjunct	MS	10	Health Science courses, SI Instructor, HAS Clinical Instruction
Doug Kap	M	W	Adjunct Instructor	Adjunct	DC	10	Chiropractic Medicine, Health Sciences
Brittney Maynard	F	W	Adjunct Instructor	Adjunct	MPC	0.5	Health Education
Eric Neff	M	W	Director of Advising Adjunct Instructor	Adjunct	MA	3	Advising & Teaching
Shauna Pitt	F	W	Adjunct Instructor	Adjunct	BS	4	Advising
Pamela Silberman	F	W	Lab Manager Adjunct Instructor	Adjunct	MS	4	Nursing, lab management

**Appendix C  
Staff Profile**

<b>Name</b>	<b>Gender</b>	<b>Race</b>	<b>Job Title</b>	<b>Years Employed</b>	<b>Areas of Expertise</b>
Chris Housley	F	W	Administrative Specialist II	1.5	Scheduling, writing, communication, organization
Carolee Calvin	F	W	Lab Instructor	10	Education, Radiologic Sciences
Brandon Folker	M	W	Lab Instructor	6	Registered Nurse
Maddison Johnston	F	W	Lab Instructor	4	Registered Nurse
Amy Teal	F	W	Lab Instructor	3	Nursing/Health Sciences
Bailey Wanner	F	W	Lab Instructor	3	Nursing/Health Sciences
Jordan West	M	W	Lab Instructor	2	Doctor of Physical Therapy
Marcos Gomez	M	Non-white	Lab Instructor	2	Health Sciences
Emily Johnson	F	W	Lab Instructor	2	Health Sciences

**Appendix D  
Financial Analysis Summary**

Health Sciences					
Funding	2015-16	2016-17	2017-18	2018-19	2019-20
Appropriated Fund	\$688,486	\$651,056	\$659,117	\$710,846	\$740,749
Other: IW Funding from CE	\$251,030	\$256,830	\$328,020	\$379,145	\$382,915
Special Legislative Appropriation					
Grants or Contracts					
Special Fees/Differential Tuition	\$49,881	\$60,714	\$131,611	\$107,991	\$133,271
<b>Total</b>	<b>\$989,397</b>	<b>\$968,600</b>	<b>\$1,118,748</b>	<b>\$1,197,982</b>	<b>\$1,256,935</b>
Student FTE Total	467.23	512.17	567.47	589.60	602.43
Cost per FTE	\$2,118	\$1,891	\$1,971	\$2,032	\$2,086

**Appendix E**  
**External Community Involvement, Names and Organizations**

Name	Organization
Justin Burr	American Physical Therapy Association (APTA), member APTA Utah, member, Board of Directors - Research Academy of Orthopedic Physical Therapy, member
Jim Hutchins	OUTReach Resource Centers Together for Responsible Cannabis Use and Education (TRUCE)
Kathy Newton	Society of Public Health Education American Alliance of Health Education Society of Behavioral Medicine American Society for Clinical Laboratory Science Resiliency Solutions Utah Cancer Specialty Center
Marvin Orrock	Collegium Aesculapium Humanitarian Outreach LDS Church Health Committee CA Medical Education Committee UPhA Pharmacy Education Committee Member U of U PharmD admissions Committee Member U of U Advisory Committee
Travis Price	American Society for Clinical Laboratory Science (ASCLS) American Society for Clinical Pathology (ASCP), member and global outreach consultant Human Anatomy and Physiology Society (HAPS)
Brad Winterton	American College of Veterinary Preventive Medicine Council of State and Territorial Epidemiologists International Society for Infectious disease Northern Utah Area Health Education Center Advisory Board



**Appendix F**  
**Site Visit Team (Internal and External Members)**

<b>Name</b>	<b>Affiliation</b>
Justin Rheese	Medical Laboratory Sciences, WSU
Conrad Gabler	Athletic Training, WSU
Christie Oneil	Emergency Healthcare, WSU
David Flint	Clinical Assistant Professor, Health Occupations Specialist, Idaho State University

Justin Burr and Brad Winterton are serving as site visit coordinators for the Department.

## **Appendix G**

### **Evidence of Learning: Courses Within the Major**

#### **Summary of Evidence of Learning**

Due to the sheer number of students in our program and the depth and breadth of the content we teach, we rely heavily on multiple-choice assessments. The data from these assessments varies from exam to exam, with some topics being more challenging than others. We also see some variation between course sections, although this appears to be minimal. The changes forced upon us by the pandemic disrupted the consistency we have seen over the last decade. The most significant change we made was to allow students to take their formative assessments (Unit Quizzes) from home, using their course notes in HTHS 1110, 1111, and 2230. In order to offset the open-book exams and better assess content retention, we expanded our summative assessment by introducing a comprehensive midterm exam and expanding the breadth of content covered by the existing final exam.

Another impactful change that occurred during this same time was our shift from commercially published course materials in HTHS 1110 and 1111 to course materials we created in-house using open source content. With this change came the introduction of new formative learning activities as well as changes in the course study guide, lab activities, video lectures, and exams. We continue to analyze, adapt, and adjust the course materials to improve learning and retention.

We looked at average scores in HTHS 1110, Integrated Human Anatomy and Physiology I, as well as the number of students achieving a 73% or better on each exam (pass rate). Average Unit Quiz scores improved with the format change, as expected given the open-notes nature of the quizzes. The average scores on the final (pre-2020) and the final and midterm combined (in 2020 and 2021) decreased markedly.

In HTHS 1111, Integrated Human Anatomy and Physiology II, we looked at the same data before and after the changes that came about in 2020. Average Unit Quiz scores improved considerably, but summative assessment (midterm and final exams) performance declined. When taken together, however, the combined average scores of Unit Quizzes, together with the comprehensive exams, improved. Pass rates improved as well, but remain low for the summative assessments.

For HTHS 2230, Introductory Pathophysiology, the course content was not changed, but we did change the way students took Unit Quizzes as well as comprehensive exams. A midterm was added and the breadth of content on the final was expanded, similar to HTHS 1110 and 1111. The change in how Unit Quizzes were administered brought about an improvement in quiz score averages but led to a decrease in pass rates on the comprehensive exams. Combined averages as well as combined pass rates remained relatively similar before and after the changes of 2020.

The content, number and format of exams in HTHS 1101 remained unchanged, except for the shift to online exam proctoring. Changes in pass rates as well as exam score averages for HTHS 1101 were insignificant.

Concurrent enrollment sections of HTHS 1101, 1110, and 1111 appear to follow what we are seeing with campus and online sections, however, there is a greater degree of variability due to the wide range of course sections and instructors. The changes that have occurred at the high schools have added a great deal of variability to how the course is administered. We have kept the content the same, but have allowed concurrent enrollment faculty some flexibility with assignment, quiz, and exam due dates.

### **Explanation**

It is logical that students would perform better on open-notes, take-home exams. We believe that lowering the stakes of these formative assessments (Unit Quizzes) led to less attention being paid to retention, which explains the lower midterm and final scores. The previous final exams were also limited to a selected subset of learning objectives, and the subset list was provided to the students. In contrast, the current midterm and final exams cover all learning objectives. This may also help explain the decline in average scores as well as pass rates on the final exam compared to previous years.

### **Action Plan**

A big advantage to creating our own content is the ability to continuously adjust and adapt the learning resources to better teach difficult concepts. We are constantly assessing the data from quizzes and exams and make content changes every semester to be more clear and better focus on challenging learning objectives. We believe this will improve average scores, as well as pass rates, on the most challenging learning objectives. We are already seeing these improvements with topics like the nervous system and the endocrine system, which were notoriously challenging before our course redesign. Over the 2021/2022 school year, we will overhaul our HTHS 2230 course to mirror the approach to learning we have taken in HTHS 1110 and 1111. We believe this will lead to better comprehension of the content and improved average scores and pass rates.

Below you will find summarized data for HTHS 1101, 1110, 1111, and 2230. More complete data-sets are available upon request.

## Health Sciences Quiz and Exam Data

HTHS 1101	Pre-2020		2020/2021		Concurrent Enrollment		*There have been no significant changes to HTHS 1101 assessments since 2015					
	Average	Pass Rate	Average	Pass Rate	Average	Pass Rate	Exam 1	Exam 2	Exam 3	Exam 4	Overall	
Exam 1	82.2	82	79	70.3	77.8	66.3	<b>Combined Averages</b>	80.6	83.4	84.6	88.1	<b>84.2</b>
Exam 2	83.2	85.9	83.5	84.4	79.4	73.5		<b>Combined Pass Rates</b>	76.2	85.2	85.8	
Exam 3	85.2	88.8	83.9	82.8	83.1	81.9						
Exam 4	86.3	89	89.9	94.5	82.7	83.3						

HTHS 1110	Pre-2020		2020/2021		Concurrent Enrollment		Average Quiz Score		Average Final and Midterm Score		Combined Average	
	Average	Pass Rate	Average	Pass Rate	Average	Pass Rate	Pre-2020	2020/2021	Pre-2020	2020/2021	Pre-2020	2020/2021
Unit 1	87.6	92.1	92.5	98.9	87.2	91.3	<b>Average Quiz Pass Rate</b>	80.8	<b>Average Final/Midterm Pass Rate</b>	74.0	<b>Average Combined Pass Rate</b>	77.4
Unit 2	80.9	73.9	79.4	72.8	76.8	64		83.3		46.2		64.8
Unit 3	80.6	74	78.1	64.6	77.5	66.3						
Unit 4	79	71.1	81	72.7	79.5	70.2						
Unit 5	83.6	82.1	83.8	82.9	83.7	81.8						
Midterm	New in 2020		71.3	46	75.7	67.9						
Unit 6	83.3	82.9	83.2	84.3	82.5	76.3						
Unit 7	85	86.2	85.5	87.8	85.7	85.2						
Unit 8	86.5	90.5	89.1	94	86.3	90.2						
Unit 9	83.8	84.1	89.5	94.6	86	90.4						
Unit 10	78.4	70.9	81.8	80.4	79.8	71						
Final	79.1	74	70.5	46.4	80.2	74.9						

HTHS 1111	Pre-2020		2020/2021		Concurrent Enrollment		Average Quiz Score		Average Final and Midterm Score		Combined Average	
	Average	Pass Rate	Average	Pass Rate	Average	Pass Rate	Pre-2020	2020/2021	Pre-2020	2020/2021	Pre-2020	2020/2021
Unit 11	76.1	66.6	88.3	93.2	82	77.8	<b>Average Quiz Pass Rate</b>	62.2	<b>Average Final/Midterm Pass Rate</b>	55.7	<b>Average Combined Pass Rate</b>	58.9
Unit 12	75.7	67	80.86	78.4	83.1	81.5		85.0		53.9		69.4
Unit 13	72.9	60.5	80.3	76.1	81	78.9						
Unit 14	70.1	54.7	83.1	81.6	78.1	67.5						
Unit 15	74	63.7	85.6	86.7	81.9	78						
Midterm	New in 2020		68.4	43.9								
Unit 16	71.2	57	89	92.8	80.1	74.1						
Unit 17	74.3	64.6	84.4	86.2	82.3	78.3						
Unit 18	74.3	64.8	86.3	90	84.8	85.3						
Unit 19	71.2	57.1	79.3	70	81.7	81.7						
Unit 20	75.6	65.9	87.8	94.9	86.6	89.2						
Final	73.24	55.7	72.4	63.8	79.9	79.2						

HTHS 2230	Pre-2020		2020/2021		Not Offered as Concurrent Enrollment		Average Quiz Score		Average Final and Midterm Score		Combined Average	
	Average	Pass Rate	Average	Pass Rate			Pre-2020	2020/2021	Pre-2020	2020/2021	Pre-2020	2020/2021
Unit 1	83.6	85.5	82.6	85.6			<b>Average Quiz Pass Rate</b>	82.7	<b>Average Final/Midterm Pass Rate</b>	75.5	<b>Average Combined Pass Rate</b>	79.1
Unit 2	85.9	90.3	82.3	77.1				85.2		72.7		79.0
Unit 3	81.8	80.4	84.1	86.6								
Unit 4	80.2	76.6	83	83.8								
Midterm	New in 2020		70.3	45.5								
Unit 5	84.5	85.6	90.5	94.1								
Unit 6	79	74.9	82.6	81.8								
Unit 7	80.1	78.9	85.4	87.5								
Unit 8	86.6	89.2	91.1	96.9								
Final	75.5	62.5	75.1	67.6								

**Evidence of Learning**  
**HTHS 1101, Medical Terminology**  
 2 credit hours  
 Required for Health Sciences Major

**Measurable Learning Outcome**

***Mastered***

- LO12. Recognize the meaning of medical words, whether written or spoken.
- LO13. Deconstruct the etymology of medical words.

***Introduced***

- LO8. Cite the ecological interactions between humans and their environment that affect human health.
- LO9. Correlate anatomical structures with their functions.
- LO10. Explain how diseases disrupt anatomy and/or physiology.

Measure	Method of Measurement (Direct & Indirect)	Threshold for Evidence of Student Learning	Findings Linked to Learning Outcomes	Interpretation of Findings	Action Plan/Use of Results
1	McGraw-Hill LearnSmart adaptive learning activities	Students achieve 100% in about 25 minutes of quizzing over chapter content	Students achieve 100% by reading the textbook & answering comprehension questions (about 20-30 min); 95% of students complete this, receiving 10/10	Students are using and achieving success on LO12, LO13, and LO14	Continue to emphasize the use of LearnSmart reports; use (e.g.) Most Missed Question lists to build learning activities and focus instruction
2	End of Chapter summary quizzes taken in-class (through McGraw-Hill Connect)	Students achieve at least 73% performance for a passing grade	Average score for these chapter quizzes is 9.8/10	In-class quizzes have improved attendance relative to previous semesters and helps focus attention during class lectures	Increase the difficulty or reduce the number of opportunities on chapter quizzes to increase attention during class
3	Multiple choice questions on 4 proctored ChiTester exams	Students achieve at least 73% performance for a passing grade	Average scores based on more than 1200 results  Exam 1: 80.6% Exam 2: 83.35% Exam 3: 84.5% Exam 4: 88.1%84.7% of students who take the exams pass with at least a 73%.	For many of our students, this is their very first college class; ≈ 17% consistently score low on exams or do not finish course	Increased attention to the first three chapters has led to improved scores; more attention to the hardest terms might improve student performance

\*At least one measure per objective must be a direct measure.

**Evidence of Learning**  
**HTHS LS1110, Integrated Human Anatomy & Physiology I**  
 4 credit hours, lab included  
 Required for Health Sciences Major  
 Life Science General Education credit

**Measurable Learning Outcome**

- LO1. Evaluate scientific and non-scientific explanations for phenomena.
- LO2. Give examples of the integration of different scientific disciplines.
- LO3. Explain interactions between science and society.
- LO4. Employ problem solving and data analysis tools.
- LO5. Classify levels of organization in humans.

Measure	Method of Measurement	Threshold for Evidence of Student Learning	Finding Linked to Learning Outcomes	Interpretation of Findings	Action Plan/Use of Results
1	Unit Quizzes – non-proctored, multiple-choice, ChiTester quizzes; each question tied to specific learning objective from the unit (see example at end of section)	73% is passing for course <i>and</i> on individual Unit Quizzes	Unit Quiz averages range from 78% (Unit 3 Quiz) to 92.5% (Unit 1 Quiz); two units covering chemistry (Units 2 and 3) have the lowest pass rates	Students have always struggled with chemistry-related units and continue to do so; lots of disparity between average scores/pass rates on Unit Quizzes vs Midterm/Final Exams	We have given Units 2 and 3 considerable time/attention with hopes of improving student learning; continue to assess/ improve these units through new course content
2	Lab Attendance	73% attendance is passing	Lab attendance consistently above 85% for last two years	Attendance in labs is strong	Increased hands-on & small-group learning activities have significant positive impact on lab attendance and lab quiz scores; continue to improve lab activities
3	Lab Content Quizzes – multiple-choice questions completed at end of lab period	73% is passing	Average lab quiz score is 88%, ranges from 82.4% (Lab 2) to 95.2% (Lab 0); 85% of students consistently pass all lab quizzes	Strong correlation between lab activities and assessment of learning related to these activities	Continue to create/ implement lab activities that generate solid learning of course content; continue to evaluate assessment tools to make sure they effectively/ accurately reflect lab- based learning
4	Midterm and Final Exam Performance – these two exams are cumulative for first half and second half of semester, respectively	73% is passing	Midterm average of 71.3%; Final average is 70.5%	On average, students performing below our standard on these summative assessments	Attention to long-term retention & learning strategies that produce better comprehension already in place; exam question analysis (to ID & revise or delete problematic or poorly-worded questions) also underway; continue both actions

**Evidence of Learning**  
**HTHS 1111, Integrated Human Anatomy & Physiology II**  
 4 credit hours, lab included  
 Required for Health Sciences Major

**Measurable Learning Outcome**

- LO1. Evaluate scientific and non-scientific explanations for phenomena.
- LO2. Give examples of the integration of different scientific disciplines.
- LO3. Explain interactions between science and society.
- LO4. Employ problem solving and data analysis tools.
- LO5. Classify levels of organization in humans.
- LO6. Diagram the ways in which human bodies obtain and use energy at the system, cellular, and molecular levels.
- LO7. Give examples of ways in which genetic processes and evolution act on the human body.
- LO8. Cite the ecological interactions between humans and their environment that affect human health.
- LO9. Correlate anatomical structures with their physiological functions.
- LO10. Explain how diseases disrupt anatomy and/or physiology.

Measure	Method of Measurement	Threshold for Evidence of Student Learning	Finding Linked to Learning Outcomes	Interpretation of Findings	Action Plan/Use of Results
1	Unit Quizzes – non-proctored, multiple-choice, ChiTester quizzes; each question tied to specific learning objective from the unit (see example at end of section)	73% is passing for course <i>and</i> on individual Unit Quizzes	Student performance varies significantly from quiz to quiz and slightly from section to section; averages range from 79.3% (Unit 19 Quiz) to 89% (Unit 16 Quiz); pass rates range from 70% of students (Unit 19 Quiz) to 92.8% of students (Unit 16 Quiz)	Students do well overall on Unit Quizzes, with pass rates well above 80% for most	Considerable time/attention to Units 11-13 already to improve student learning; improvement observed comparing current scores vs 5 years ago; continue to assess/improve lower score/pass rate units
2	Lab Attendance	73% attendance is passing	Lab attendance consistently above 90% for last two years	Lab attendance is strong	Increased hands-on & small-group learning activities have significant positive impact on lab attendance and lab quiz scores; continue to improve lab activities
3	Lab Content Quizzes – multiple-choice questions completed at end of lab period	73% correct is passing	Average lab quiz score is 87%, ranges from 82.5% (Lab 13) to 91.1% (Lab 20); 80% of students consistently pass all lab quizzes (except Lab 13, 76.1% pass rate)	Strong correlation between lab activities and assessment of learning related to these activities	Continue to create/ implement lab activities that generate solid learning of course content; continue to evaluate assessment tools to make sure they effectively/ accurately reflect lab-based learning; restructure Labs 11-13 to improve comprehension
4	Midterm and Final Exam Performance – these two exams are cumulative for first half and second half of semester, respectively	73% is passing	Midterm average 68.4%; Final average is 72.4%; both have low pass rates (43.9% for Midterm, 63.8% for Final)	On average, students performing below our standard on these summative assessments	Attention to long-term retention & learning strategies that produce better comprehension already in place; exam question analysis (to ID & revise or delete problematic or poorly-worded questions) also underway; continue both actions

**Evidence of Learning**  
**HTHS 2230, Introductory Pathophysiology**  
 3 credit hours  
 Required for Health Sciences Major

**Measurable Learning Outcome**

- LO1. Evaluate scientific and non-scientific explanations for phenomena.
- LO4. Employ problem solving and data analysis tools.
- LO6. Diagram the ways in which human bodies obtain and use energy at the system, cellular, and molecular levels.
- LO7. Give examples of ways in which genetic processes and evolution act on the human body.
- LO9. Correlate anatomical structures with their physiological functions.
- LO10. Explain how diseases disrupt anatomy and/or physiology.

**Emphasized**

- LO8. Cite the ecological interactions between humans and their environment that affect human health.
- LO11. Evaluate probable causes of disease, given a case study.

Measure	Method of Measurement	Threshold for Evidence of Student Learning	Findings Linked to Learning Outcomes	Interpretation of Findings	Action Plan/Use of Results
1	Prerequisite Quiz – review of basic physiology/cell biology concepts (in Canvas) to assess preparation for course	Students instructed to review prerequisite material, take quiz, achieve at least 80% to show preparation for course	Average score 89%; over 80% of students achieve 80% in first two attempts; some students skip as points not included in course grade; small number cannot score 80% despite multiple attempts	Some students not adequately prepared for course (poor performance on prerequisite quiz); these to withdraw, retake 1110 &/or 1111	Prerequisite quiz covers very select topics, may not be great indicator of overall preparation for course; revise prerequisite quiz when course redone this year
2	Reading Assignment Quizzes - students read high-level medical journal article, answer content questions	73% is passing	Scores consistently above 80%	Students do relatively good job reading/ interpreting medical journal article	Need to assess if this activity promotes/ assesses learning as intended; apparent that students often search article for answers w/o attempt to fully comprehend
3	Unit Quizzes – non-proctored, multiple-choice, in ChiTester; beginning Fall 2020, done online at home, open-notes	73% is passing	Average score 85.2%, ranges from 82.6% (Unit 6) to 91.1% (Unit 8); average pass rate 86.7%, ranges from 77.1% (Unit 2) to 96.9% (unit 8)	Solid performance on Unit Quizzes (expected with open-notes format); some inconsistency in breadth/depth of coverage among units	Course overhaul will include better topic distribution of topics and learning objectives with better comparison of results between learning units. We will assess deficiencies in how we addressed different topics in the previous course materials
4	Midterm and Final Exam Performance – these two exams are cumulative for first half and second half of semester, respectively	73% is passing	Average Final Exam score prior to Fall 2020 was 75.5%; average on Midterm and Final Exams since then is 72.7%; Final Exam pass rate dropped from 62.5% to 56.6%	Students struggle to retain information long-term; problem has worsened new Unit Quiz format	Course overhaul will address how to improve long-term course content retention; possible approach to use Unit Quizzes as formative exercise more than at present



**Evidence of Learning**  
**HTHS 2231, Introductory Pathophysiology Laboratory**  
 1 credit hour  
 Required for Health Sciences Major

**Measurable Learning Outcome**

- LO9. Correlate anatomical structures with their physiological functions.  
 LO10. Explain how diseases disrupt anatomy and/or physiology.  
 LO11. Evaluate probable causes of disease, given a case study.

Measure	Method of Measurement	Threshold for Evidence of Student Learning	Findings Linked to Learning Outcomes	Interpretation of Findings	Action Plan/Use of Results
1	In-lab Canvas quizzes	73% or better to demonstrate competence	Students struggle with same material as in HTHS 2230	Student feedback indicates they might not be connecting laboratory material to lecture (2230) material	Use feedback to further revise these labs; experiment with innovative modalities combined with case studies, Anatomage demonstrations, plastinated cadaver material; explore ways to link lecture (2230) and lab topics (2231) to better complement each other
2	Exams in ChiTester – due same day as HTHS 2230 exams (8 exams)	73% is passing	Students struggle with same material as in HTHS 2230	Lab could be better used to help students master pathophysiological basis for immune and endocrine diseases; cement student learning by careful dovetailing of lecture and lab	Use results to further revise these labs; course overhaul will include revamp of lab activities

**Evidence of Learning**  
**General Education, Life Science Courses**  
**HTHS LS1110**  
 Summer and Fall 2020  
 1300 Students in 12 Sections

**General Education Learning Goal**

S1. Nature of Science. Scientific knowledge is based on evidence that is repeatedly examined and can change with new information. Scientific explanations differ fundamentally from those that are not scientific.

**Measurable Learning Outcome**

LO1. Understand the nature of science as presented in a Life Science video made by Dr Price.

LO2. Demonstrate a knowledge of data sources and methods for evaluating them.

Measure	Method of Measurement (Direct & Indirect)	Target Performance	Actual Performance	Interpretation of findings	Action Plan/Closing the Loop
1	Performance on content quiz	At least 70% of students demonstrate mastery at 70% or higher	84%	Students above threshold	Create additional activities (such as with EdPuzzle) to demonstrate mastery of this topic
2	Performance on Signature Assignment (see attached rubric)	At least 70% of students demonstrate mastery at 70% or higher	80%	Students demonstrate mastery of data sources and methods	Continued improvement of these scores with additional training for students

\*At least one measure per objective must be a direct measure.

**General Education Learning Goal**

S2. Integration of Science. All natural phenomena are interrelated and share basic organizational principles. Scientific explanations obtained from different disciplines should be cohesive and integrated.

**Measurable Learning Outcome**

LO1. Demonstrate a knowledge of questions related to Integration of Science on an open-book, multiple-choice quiz and a closed-book, proctored, multiple-choice exam.

Measure	Method of Measure	Target Performance	Actual Performance	Interpretation of findings	Action Plan/Closing the Loop
1	Score on 51 questions related to Integration of Science in Unit Quizzes	80% (average on all quiz questions 82%)	80%	Students demonstrate knowledge of these questions when able to look them up	Increase the number of learning opportunities related to integration of science; revise pool questions as necessary
2	Score on 51 exam questions (same questions as quiz, different delivery method)	70% (average on all exam questions 71%)	70%	Students retain this information, albeit at lower percentage, on closed-book, proctored exam	Reduce gap between open- and closed-book tests with more effective learning activities (formatives)

<b>General Education Learning Goal</b>					
S3. Science and Society. The study of science provides explanations that have significant impact on society, including technological advancements, improvement of human life, and better understanding of human and other influences on the earth's environment.					
<b>Measurable Learning Outcome</b>					
LO1. Demonstrate a knowledge of questions related to Science and Society on an open-book, multiple-choice quiz and on a closed-book, proctored multiple-choice exam.					
Measure	Method of Measure	Target Performance	Actual Performance	Interpretation of findings	Action Plan/Closing the Loop
1	Score on 7 questions related to Science & Society in Unit Quizzes	80% (average on all quiz questions is 82%)	75%	Students demonstrate knowledge of these questions when able to look them up	Increase the number of learning opportunities related to integration of science; revise pool questions as necessary
2	Score on 7 exam questions (same questions as quiz, different delivery method)	70% (average on all exam questions is 71%)	66%	Students retain this information, albeit at lower percentage, on closed-book, proctored exam	Reduce gap between open- and closed-book tests with more effective learning activities (formatives)

<b>General Education Learning Goal</b>					
S4. Problem Solving and Data Analysis. Science relies on empirical data, and such data must be analyzed, interpreted, and generalized in a rigorous manner.					
<b>Measurable Learning Outcome</b>					
LO1. Demonstrate a knowledge of Problem Solving & Data Analysis in targeted lab activities.					
Measure	Method of Measure	Target Performance	Actual Performance	Interpretation of findings	Action Plan/Closing the Loop
1			Only minimal data analysis and interpretation exist in course as currently organized		Add activities to course and lab to give students opportunity to demonstrate proficiency in this area
2					

<b>General Education Learning Goal</b>					
LS1. Levels of Organization. All life shares and organization that is based on molecules and cells and extends to organisms and ecosystems.					
<b>Measurable Learning Outcome</b>					
LO1. Demonstrate a knowledge of questions related to Levels of Organization on an open-book, multiple-choice quiz and on a closed-book, proctored multiple-choice exam.					
Measure	Method of Measure	Target Performance	Actual Performance	Interpretation of findings	Action Plan/Closing the Loop
1	Score on 121 questions related to Levels of Organization in Unit Quizzes	80% (average on all quiz questions is 82%)	81%	Students demonstrate knowledge of these questions when able to look them up; Levels of Organization questions represent ≈7% of HTHS 1110 pool, important component of any Anatomy & Physiology class	Revise pool questions as necessary; students currently score <60% on 14 of these 121 questions on open-book quiz
2	Score on 121 exam questions (same questions as quiz,	70% (average on all exam	66%	Students retain this information, albeit at a lower percentage, on a closed-book, proctored exam	Reduce gap between open- and closed-book tests with more

	different delivery method)	questions is 71%)			effective learning activities (formatives)
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<b>General Education Learning Goal</b>					
LS2. Metabolism and Homeostasis. Living things obtain and use energy and maintain homeostasis via organized chemical reactions known as metabolism.					
<b>Measurable Learning Outcome</b>					
LO1. Demonstrate a knowledge of questions related to Metabolism and Homeostasis on an open-book, multiple-choice quiz and a closed-book, proctored multiple-choice exam.					
Measure	Method of Measure	Target Performance	Actual Performance	Interpretation of findings	Action Plan/Closing the Loop
1	Score on 85 questions related to Metabolism & Homeostasis in Unit Quizzes	80% (average on all quiz questions is 82%)	79%	Students demonstrate knowledge of these questions when able to look them up; Metabolism & Homeostasis questions represent ~5% of HTHS 1110 pool, important component of any Anatomy & Physiology class	Revise pool questions as necessary; students are currently scoring <60% on 13 of these 85 questions on open-book quiz
2	Score on 85 exam questions (same questions as quiz, different delivery method)	70% (average on all exam questions is 71%)	66%	Students retain this information, albeit at a lower percentage, on a closed-book, proctored exam	Reduce gap between open- and closed-book tests with more effective learning activities (formatives)

<b>General Education Learning Goal</b>					
LS3. Genetics and Evolution. Shared genetic processes and evolution by natural selection are universal features of all life.					
<b>Measurable Learning Outcome</b>					
LO1. Demonstrate a knowledge of questions related to Genetics and Evolution on an open-book, multiple-choice quiz and a closed-book, proctored multiple-choice exam.					
Measure	Method of Measure	Target Performance	Actual Performance	Interpretation of findings	Action Plan/Closing the Loop
1	Score on 34 questions related to Genetics & Evolution in Unit Quizzes	80% (average on all quiz questions is 82%)	84%	Students demonstrate knowledge of these questions when able to look them up	No action needed; multiple opportunities for students to demonstrate knowledge
2	Score on 34 exam questions (same questions as quiz, different delivery method)	70% (average on all exam questions is 71%)	76%	Students retain this information, albeit at a lower percentage, on a closed-book, proctored exam	Reduce gap between open- and closed-book tests with more effective learning activities (formatives)

<b>General Education Learning Goal</b>					
LS4. Ecological Interactions. All organisms, including humans, interact with their environment and other living organisms.					
<b>Measurable Learning Outcome</b>					
LO1. Demonstrate a knowledge of questions related to Ecological Interactions on an open-book, multiple-choice quiz and a closed-book, proctored multiple-choice exam.					
Measure	Method of Measure	Target Performance	Actual Performance	Interpretation of findings	Action Plan/Closing the Loop
1	Score on 4 questions related to Ecological Interactions in Unit Quizzes	80%	84%	Students demonstrate knowledge of these questions when able to look them up	Increase number of Ecological Interaction connections in Study Guide and PowerPoints, and related questions in pool
2	Score on 4 exam questions (same questions as quiz, different delivery method)	70%	73%	Students retain this information, albeit at a lower percentage, on a closed-book, proctored exam	Reduce gap between open- and closed-book tests with more effective learning activities (formatives)

## **Appendix H: Signature Assignment Instructions and Rubric**

### **HTHS 1110 Signature Assignment Instructions**

#### **Rationale:**

HTHS 1110 is a Life Science General Education (Gen Ed) course at WSU. A “signature assignment” is required for all Gen Ed courses. These assignments are intended to help students appreciate the broader implications and meaning of the course.

#### **Summary:**

The world is full of information. Some of it is credible, promotes solid ideas based in science and research, and helps improve society as a whole. Some information is not reliable, does not have credible sources, is intended to deceive or promote personal beliefs or ideas, and is often harmful to society. Being able to discern what is truth and what is something else is a critical skill for professionals in general, but especially important for those in healthcare. This Signature Assignment will give you the opportunity to scrutinize information, critique and analyze claims, interpret evidence, evaluate situations, and explore different perspectives. These skills are at the core of what we consider the intellectual tools that every educated person should have.

#### **Instructions:**

In healthcare, we are constantly bombarded with questions about science and medicine. With the current COVID-19 pandemic, these questions have increased in frequency and complexity. For this assignment, you will address the big question, “How can I know that what I am telling others is the truth?”

To begin, you will select a question that has some kind of personal connection to you. For example, this question could be a personal concern, a social concern you care about, or even an actual question a patient, friend, or family member has asked you. The question should be something that you cannot simply answer by yourself using only opinions or personal beliefs. Try to think of something that needs some kind of evidence or data to support your response. For example, a question like “are vaccines bad?” is complicated and complex, requires a moral opinion (who decides what “bad” means?), and is fraught with problems if you were to try to give a short answer. A better way to rephrase the question is, “Are vaccines safe for the general population?” There are very few limits on the type of question you can ask, but try to keep it realistic. Think of the last time you had a conversation with other people about COVID-19 or another scientific or medical topic. What questions came up that you made you feel a little uncomfortable answering without looking up some more information? That is the type of question we are looking for.

After deciding on a question, your next step is to find credible information about that topic. Answering the question will not be nearly as important as being able to explain where you got the information to support your answer and how you know it can be trusted. This is where the critical thinking piece comes in. We want you to apply what you learned this semester through

our discussions of the scientific method and general life science concepts (remember the video you watched?) to finding truthful information about your topic. Be like Galileo! He studied, performed experiments, gathered information, reflected, studied more, questioned the beliefs of those around him as well as his own beliefs, then trusted in the science and made the outlandish claim that the earth revolved around the sun, not the sun around the earth. When he presented these findings, the prominent church at the time had him tried and arrested. But, he was right and his method for discovering truth held up. This assignment may challenge your previously held beliefs. That's ok. It is important for any educated person to be able to recognize when they may have been wrong.

The final piece of this assignment is a written description of the answer and your source, as well as why that source is credible. As a part of this, you will need to select an audience. Who are you explaining this to? For example, you could say "Audience: a group of CNA coworkers at the hospital where I work" or "Audience: my aunts and uncles who were arguing about this at the last family party we had." You will then briefly answer the question and explain why you trust that answer. **Keep the answer to only a sentence or two** as the focus of this assignment is on how you came to that answer more than it is the answer itself. After identifying your audience, concisely answer the question and then give at least three reasons why your source is credible.

### Summary of Steps:

1. Watch the Life Science video found in the Signature Assignment module in Canvas.
2. Read through these instructions and the grading rubric.
3. Think of a question you have a personal interest in. Decide if that question would be answerable with a little research.
4. Find a credible, factual source that helps you answer your question.  
Click [here](#) to watch Jason Francis, the Health Professions librarian, help you find articles using WSU's databases.
5. Decide the audience you want to write to.
6. Write your question, audience, answer, source, and justification for your source.
7. Compile all of it together in a nice organized document.
8. Go through the grading rubric and make sure your paper would receive the highest score possible in each category.
9. Submit your assignment before the due date. The sooner the better!

### Some helpful tips:

Part of being educated is being able to present ideas clearly in written format. Pay attention to spelling and grammar when you put this together. You can choose to write in whatever voice you are comfortable with (1st person, 3rd person, etc.), but make sure your sentences are clear and concise and effectively convey information. In scientific writing, simpler, shorter sentences are often better than longer, more complicated ones. This isn't a text message to your bestie, nor is it a PhD dissertation. We want to give you some flexibility here, but pay attention to how your final product looks. It's never a bad idea to run it by a friend or family member and ask, "Does this look ok to you? Can you see anything I should fix?"

## Guidelines to follow:

- No more than a single page, with no more than two paragraphs of writing. Should not be less than a paragraph
- Your name, your professor's name and the date should be easy to find
- Avoid spelling and grammar errors
- Your question, answer, source, and justification for the source you chose should be apparent
- There should be a clear connection between your source and your answer

It might be helpful to think about what we are looking for in grading your assignment. Here is the grading rubric we will use. The total possible is 50 points. This is added to your results on the Life Science Video quiz (10 points). Together, these 60 points will represent 5% of your final grade.

Grading Rubric	10 points	5 points	0 points
<b>Question</b> (Did the student carefully select a question related to science, medicine, or healthcare? Does that question have a personal, social or professional connection to the student?)	It is obvious why the question is significant to the student. The question is clear and free of moral implications. The question can be answered using credible data and reputable sources.	The question is vague or only somewhat tied to science and medicine. The question may require some degree of moral judgement.	There is no apparent question or the question has nothing to do with science or medicine. The question is impossible to answer or has no scientific merit.
<b>Integrating and Applying Course Content</b> (Was the source obvious and does it meet the criteria presented to be considered credible? Did the student clearly express how the source met those criteria?)	There is an obvious source. This source is credible and meets the criteria discussed in class. The reasoning for selecting the source is solid and logical.	The source given is of questionable credibility. The reasoning behind selecting the source is poor and does not relate, or only loosely relates back to the concepts presented in class.	There is no obvious source given. The source given is not credible. There is no reasoning for why the source was selected.
<b>Audience</b> (Did the student select an appropriate audience and address their comments in an appropriate way?)	The audience is expressly stated. Writing is appropriate for the audience and is free of grammar or spelling errors.	The audience is implied but not expressly stated. The writing of the explanation is only somewhat appropriate for the audience. 2-3 spelling or grammatical errors.	There is no audience mentioned. The writing of the explanation is not appropriate for the audience. There are many spelling and grammatical errors.
<b>Intellectual Tools</b> (Did the student demonstrate critical thinking, analytical skills, problem solving, or sound interpretation of evidence?)	The answer and the source are clearly connected. It is apparent why the source provides credible support for the answer. Critical thinking and effective evaluation of information are apparent.	There is some connection between the answer given and the source. The logic for why the source was selected is somewhat apparent. There is some evidence of critical thinking and effective evaluation.	There is no answer or justification for the source. The answer does not match the question. The answer is entirely wrong with no supporting evidence. The evidence presented does not justify the source selected.
<b>Style and Format</b> (Was the required information easy to find and well organized?)	Well formatted, easy to read, all components of the assignment are easy to find. Adheres to the guidelines for the assignment.	There is some semblance of formatting, but critical components of the assignment are hard to find or not readily apparent. Misses some of the assignment guidelines.	There is a total lack of organization. Organization is sloppy. Critical components of the assignment are missing. Guidelines for the assignment appear to be ignored.



Additional Summary Information (as needed)