Professional Leave Report Cover Sheet

Name: Karen Chooljian

Department: Biology

College: Science & Mathematics

Leave taken: X Sabbatical Difference in Pay Professional Leave without Pay

Time Period: X Fall

Spring

Academic Year

Other

Please upload your report to this DocuSign envelope. Your report will be sent to your Dean for your PAF and to the Library Archives. You will also receive a confirmation copy.

Report on the Sabbatical

Fall Semester 2020

Karen M. Chooljian, M.S.
Lecturer, Anatomy and Physiology
Department of Biology
February 7, 2021

The sabbatical was requested to provide time to redesign and improve the lecture and laboratory curricula of the Biology 33 (Introduction to Human Anatomy and Physiology), Biology 67A (Human Anatomy & Physiology I), and Biology 67B (Human Anatomy & Physiology II) courses.

The proposal outlined three goals to improve instruction for the Biology Department's three Anatomy and Physiology courses that impact approximately 600 students per year. These goals included:

1. Reorganize the curricula to conform to the CSU Quality Learning and Teaching design principles.
2. Reduce student costs for these courses.
3. Provide consistent teaching via online methods in the laboratory components of these courses.

Section 1. Reporting on the Success of the Leave

All three stated goals of the proposal have been achieved. The curricula for all three courses have been reorganized and refined for online (lecture) and blended format (laboratory) instruction.

- The curricula now conform more closely to the CSU Quality Learning and Teaching (QLT) "Core 24" design principles.
- Student costs for the courses have been reduced.
- Methods for teaching the laboratories in a more consistent method were developed and are currently in use.

Accomplishment of the Goals Outlined in the Proposal

1. The primary goal of the sabbatical was to reorganize the curricula to conform more closely to the CSU Quality Learning and Teaching (QLT) "Core 24" design principles. This goal has been accomplished, with some modifications in the laboratory components to reflect the fact that laboratories are currently taking place online rather than in the expected blended format.

- **Creation of a new online text and laboratory manual for Biology 67A and Biology 67B using QLT design principles**
    - A new online textbook and laboratory manual for Biology 67A and Biology 67B was researched, written, edited, and has been deployed for Biology 67A this semester. For continuity, Biology 67B is

currently using the text and lab manual from McGraw Hill deployed in the fall Biology 67A course. The new text and laboratory manual, *Human Anatomy and Physiology, a Two Semester Course* (see Attachment A) consists of 23 text chapters and, currently, 16 laboratory chapters. I can invite you as an instructor to activate the link in the above title should you request access to it. Both the text and laboratory manual use the Top Hat platform, which allows formative assessments that are pertinent to learning anatomy, e.g., "click on target" questions for identification of anatomical structures. Standard question formats are also available and each chapter utilizes formative assessments to emphasize course goals and student learning outcomes. The summative assessments have yet to be given for the courses but the formative assessments, designed into both the texts and laboratory manuals, indicate increased student retention of information and increased completion of course goals and student learning outcomes.

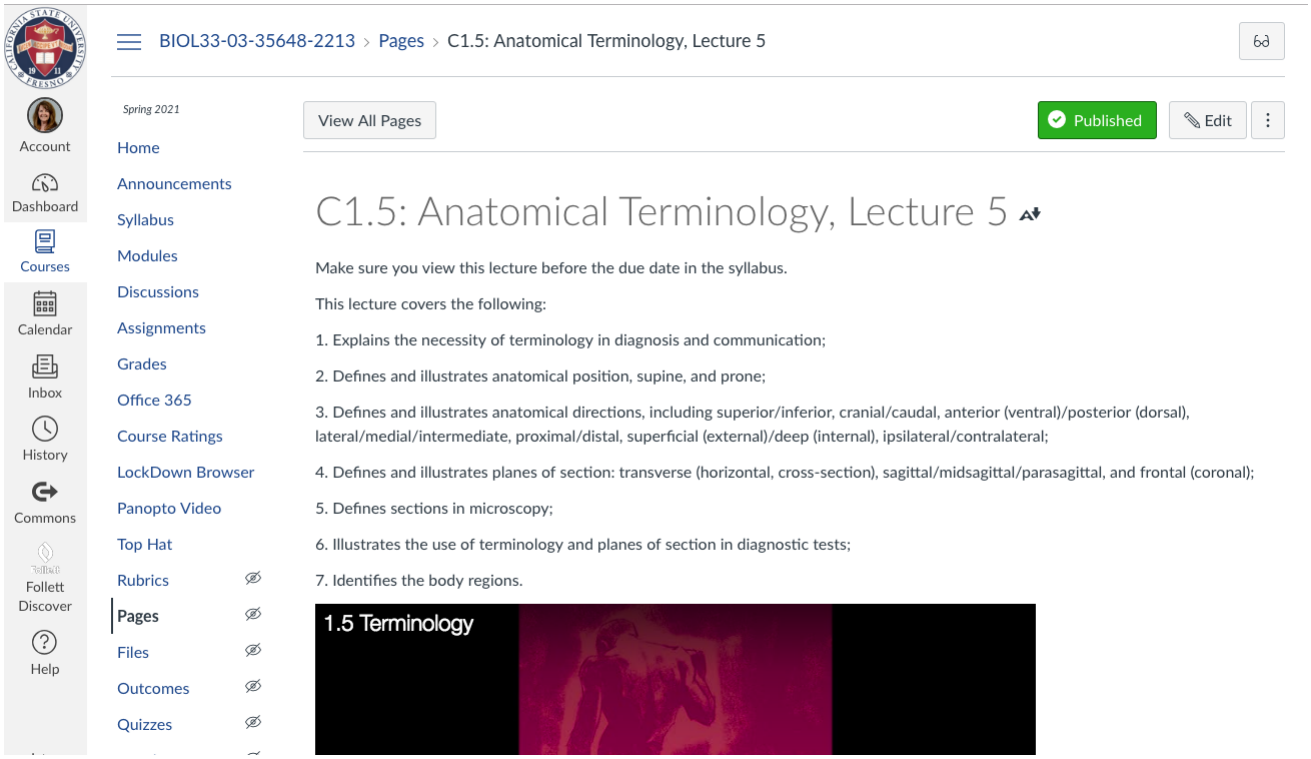
- The laboratory manual was written and designed for a blended course format, but the decision to retain online teaching for this spring semester caused some modifications in the content. Please see #3 below.

- **Edit of the existing online text and laboratory manual for Biology 33 using QLT design principles**
  - The text and laboratory manual for Biology 33, *Introductory Anatomy & Physiology, Text and Laboratory Manual* has been completely edited for content and redesigned to comply with QLT. As in the courses above, the Top Hat platform is used and allows formative assessments to emphasize course goals and student learning outcomes. There are 20 chapters in the text and 16 in the laboratory manual. Content was edited to reflect current research and knowledge. Questions were edited and comply with formative assessment guidelines.
  - As above, the laboratory manual was written and designed for a blended course format, please see #3 below.

- **Redesign of the lecture component of Biology 33, 67A, and 67B using QLT design principles**
  - All lectures in all three courses have been edited for content and length, recorded in Snagit, edited in Camtasia, and captioned in either Camtasia or Panopto. In addition, as seen in Figure 1 below, each lecture has been added to an assigned Page in Canvas and related to course goals and student learning outcomes. Students are asked to read the text first, then listen to the recorded lectures, and then attend the synchronous Zoom classroom. At first glance, given the brief time (2 weeks) to analyze student performance in the large group instruction of these courses, coupling asynchronous lectures with

synchronous discussion has been a resounding success. Students seem to be motivated, interested, and are asking pertinent, focused questions.

Figure 1: Example Canvas Page for Chapter 1, Section 5 of the Biology 33 textbook.



- **Redesign of the laboratory components of Biology 33, 67A, and 67B using QLT design principles**
    - The laboratory portion of all courses has been redesigned to conform to QLT, including formation of anatomy study modules that centralize information and online resources. Pre- and post-lab formative assessments were edited or created and interactive PowerPoint (IP) presentations were edited or created to allow students to study laboratory models online. Pre-existing IP presentations were edited to be specific to the individual courses.
    - The original objective of creating complete laboratory lectures and illustrate all models in the laboratory has been hampered by my inability to be on campus (please see #3 below). In spite of the obstacles created by Covid-19, the goal to restructure the laboratories to the QLT guidelines has been met and the additional resources can be used when laboratory instruction on campus is safe again.

Should you wish to view the new course structure, I would be happy to have you view the Canvas shells reflecting the course redesign. They are available at:
Biology 33: https://fresnostate.instructure.com/courses/39098
Biology 67A: https://fresnostate.instructure.com/courses/38142
Biology 67B: https://fresnostate.instructure.com/courses/38144

2. The secondary goal of reducing the costs of these courses to the students by producing an online text and laboratory manual has been met.

- The cost of the Biology 33 text and laboratory manual (per original proposal) dropped by 75% with a student success rate of 77% versus historical 75% rate. The current cost remains the same and negotiations with the online platform, Top Hat, caused a reduction in subscription cost from $33.00 to $15.00. Please note that this is less than the cost for the iClicker subscription ($15.99, online resources). Top Hat can be accessed through a smart phone (though I do not recommend this) or any tablet, laptop, or desktop computer.

- The cost of the new text and laboratory manual, for both Biology 67 *and* Biology 67B (in other words, for two semesters) is $70.00 (with access to the text for life) plus a semester subscription of $15.00 ($30.00 total for both courses). This equals $100.00 for *both* Biology 67A and Biology 67B, or $195.00 less than the cost of McGraw Hill's current cost to the students in which they can only access the text for 2 years. Access codes for LearnSmart online were $155.00 for two semesters (before they learned I was moving to Top Hat) plus $70 for a *used* textbook (or $45.00 for a printed copy of the online textbook), plus $70 for the laboratory manual, total = $ 295.00). This cost savings represents a reduction to 33.9% of the cost in previous semesters, again for two courses and two semesters.
    - Many students in my courses need to access the basic anatomy and physiology as they progress through their majors. The ability through Top Hat to access the basic anatomy and physiology textbook for life is a benefit for them and will not cause them any additional costs in their future education.

3. The third goal was to provide a more consistent lecture component across the Biology 33, Biology 67A, and Biology 67B labs.

- This required the design, development, and recording of lectures that can be viewed ahead of the scheduled laboratory periods. This has been done, but this portion of the goals was hampered by my inability to access laboratory equipment, models, and histological slides to completely address the needs of

the laboratories. It is impossible to show laboratory protocols (e.g., showing where to place BIOPAC electrodes on a test subject) under current CSU Covid-19 social distancing guidelines. In addition, I have a chronic respiratory condition and going to campus to photograph or video for the new laboratory manual placed me at risk. In spite of these drawbacks, modifications to the laboratory curricula have been made, both in spring semester of 2020 and in the current semester, utilizing other resources. Online and virtual laboratory experiences that are free to the students, including Acland's Video Atlas of Human Anatomy and Labster virtual laboratories, are currently being utilized and have allowed for consistent teaching via online methods in the laboratory components of all three courses. Unfortunately, most online options do not allow fulfillment of one of the course goals (gain knowledge and experience in the basic methods, instrumentation and quantitative analytical skills used in physiology), but the original sabbatical proposal assumed a blended format.

- In addition, I became more aware that part of my responsibility as an educator is not just to the students taking my courses, but also to the graduate students who are my laboratory Teaching Assistants (TAs). Complete redesign of the laboratory lectures to bypass the instructors does not allow the graduate students to learn how to teach anatomy and physiology. With that caveat in mind, I created online lectures for the laboratories and will place them in the lecture Canvas when the Covid-19 restrictions allow laboratories on campus, but I will indicate that they are to be used as a baseline. The TAs must take the lectures and provide their own online versions to which they may add information, but not delete any pertinent facts. The basic information in my online lectures is there to provide the consistent lecture component. This goal has been completed, with some minor modifications.

In conclusion, all goals of the original proposal have been met, with some laboratory modifications necessary because of the current Covid-19 restrictions.

Section 2. Benefits to Karen M. Chooljian as a faculty member

The sabbatical, combined with the Covid-19 requisite move to online instruction in March of 2020, provided both the impetus (semester already in progress) and time for research and reflection (sabbatical) to redesign the three courses utilizing the guidelines of the QLT to develop and organize the curricula. In terms of the original proposal:

- I have used the guidelines of the QLT to develop and organize the curricula in my courses to meet the guidelines and advance my teaching capabilities.
- The material in all three courses has been reorganized and refined.

- I have researched the current physiological and health care-related information and that is reflected in the text, laboratory manual, and lectures.
- I am already seeing an improvement my ability to provide timely feedback to my students because the synchronous online meetings allow more student interaction than the standard face-to-face lecture provided. Students ask questions through the chat, email, in-course discussions, or a combination thereof and the discussions lead to more questions, which I can answer immediately. In terms of demonstrated student knowledge, the lecture Zoom meetings this semester are an affirmation of the formative assessments in the redesign. It is too early in the semester to have any data on the summative assessments or overall performance.
- Increased student success for my students may be seen in the future for all three courses, but that data will not be available until the end of this and subsequent semesters.
- Lowered costs to the students in my courses have already been established above. As a student who had to work part-time to fund both my undergraduate and graduate education, this is especially gratifying to me.
- The opportunity to network with faculty in the CSU system that design and assess online content has been somewhat limited because educators have been coping with the restrictions of Covid-19 (which include increased time online and less time to interact with other professors), but my interactions with some of my colleagues throughout the state assisted the refinement of the course redesign.
- By researching the data underlying the new text for Biology 67A and 67B, I am more cognizant of the recent advances in physiology and have incorporated them into the new or edited texts and laboratory manuals.

Section 3. Benefits to the university

- An improved curriculum to increase student success in three highly impacted courses has been achieved.
- A lowered cost to the students participating in these courses has been achieved.
- A curriculum redesign could eventually lead to a set of fully online courses, but indications are that a face-to-face laboratory is more valuable for student learning and success. In spite of that caveat, a fully online lecture component could allow these impacted courses to reach more students and remove a "bottleneck" in their progression toward their degree.

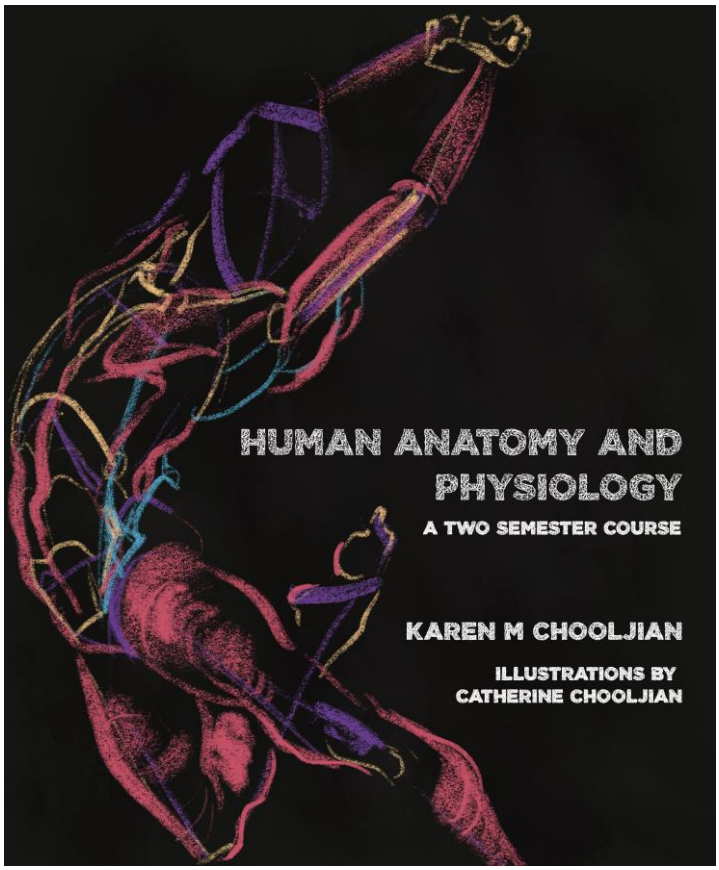
Section 4. Original Proposal

Please see Attachment B.

Section 5. Seminar or open presentation

To be arranged if there is interest.

Attachment A
Textbook for Biology 67A and 67B



Human Anatomy and Physiology I and II Text

- Chapter 1: Introduction to Anatomy and Physiology
- Chapter 2: Basic Biochemistry and Metabolism
- Chapter 3: Cells
- Chapter 4: Cellular Communication
- Chapter 5: Tissue Organization and Function
- Chapter 6: The Integumentary System
- Chapter 7: Skeletal System: Bone Structure, Growth, and the Axial Skeleton
- Chapter 8: Skeletal System: Appendicular Skeleton and Articulations
- Chapter 9: Muscular System: Muscular Structure and Function
- Chapter 10: Muscular System: Muscles and Movements
- Chapter 11: Nervous System: Cells, Tissues, and Neurophysiology

- Chapter 12: Central Nervous System: Brain and Spinal Cord
- Chapter 13: Peripheral Nervous System: Cranial and Spinal Nerves, the Autonomic Nervous System, and Reflexes
- Chapter 14: General Sensation and Special Senses
- Chapter 15: Endocrine System
- Chapter 16: Cardiovascular System: Blood and the Anatomy of the Heart
- Chapter 17: Cardiovascular System: Physiology of Circulation
- Chapter 18: Lymphatic System and Immunity
- Chapter 19: Respiratory System
- Chapter 20: Urinary System, Fluid and Electrolyte Balance
- Chapter 21: Digestive System
- Chapter 22: Metabolism, Nutrition, and Exercise Physiology
- Chapter 23: Reproductive System and Development

Lab Manual

- Laboratory Safety Rules
- List of Models
- Lab Chapter 1: Introduction, Terminology, and Organ Systems
- Lab Chapter 2: The Cell: Anatomy, Division, and Cell Membrane Transport Mechanisms
- Lab Chapter 3: Tissues: Classification and Identification
- Lab Chapter 4: The Integumentary System
- Lab Chapter 5: Bone Histology and the Axial Skeleton
- Lab Chapter 6: The Appendicular Skeleton and Joint Movements
- Lab Chapter 7: Muscle Histology and the Muscular System
- Lab Chapter 8: Neurons and the Central Nervous System
- Lab Chapter 9: Peripheral Nervous System, Autonomic Nervous System, and Reflexes
- Lab Chapter 10: General and Special Senses
- Lab Chapter 11: Anatomy of the Endocrine System and Blood
- Lab Chapter 12: The Heart, Circulatory System, and Anatomy of the Lymphatic System
- Lab Chapter 13: The Respiratory System

- Lab Chapter 14: The Digestive System
- Lab Chapter 15: The Urinary System
- Lab Chapter 16: The Reproductive System

Attachment B
Original Sabbatical Proposal

Sabbatical Proposal
Fall Semester 2020

Karen M. Chooljian, M.S.
Lecturer, Anatomy and Physiology
Department of Biology
October 7, 2019

This sabbatical request is to provide time to redesign and improve the lecture and laboratory curricula of the Biology 33 (Introduction to Human Anatomy and Physiology), Biology 67A (Human Anatomy & Physiology I), and Biology 67B (Human Anatomy & Physiology II) courses.

Section 1. The Proposal

This proposal outlines three goals to improve instruction for the Biology Department's three Anatomy and Physiology courses that impact approximately 600 students per year. Most of these students are seeking future careers in the health sciences. These goals include:

4. Reorganize the curricula to conform to the CSU Quality Learning and Teaching design principles.
5. Reduce student costs for these courses.
6. Provide consistent teaching via online methods in the laboratory components of these courses.

These goals are explained in further detail below.

Goals:

1. The primary goal of this sabbatical is to reorganize the curricula for Biology 33, Biology 67A, and Biology 67B to conform more closely with the CSU Quality Learning and Teaching (QLT) "Core 24" design principles, with the eventual goal of delivering an online, flipped format for the lecture portions, including the laboratory lecture components (see goal number 3 below). These classes currently use large group instruction and reorganization is critical for student success; currently lectures are given in MCL121 and it is difficult to teach the QLT design principles effectively in this room. Accomplishing this objective:

    I am currently enrolled in the fall 2019 "Introduction to Teaching Online Using the QLT Instrument (Q1) in order to prepare myself for the required changes in curricula. I already teach with a blended course format in all three courses but am aware that improvement is possible. The current format of my lectures (face-to-face) must be

changed to comply with the "Core 24" design principles for a flipped format. I have already participated in DISCOVERe and am aware of the techniques required and can complete the course restructuring within the semester timeline.

2. The secondary goal is to reduce the costs of these courses to the students by producing an online text and laboratory manual for each course. Accomplishing this objective:

   I wrote both an online text and lab manual for Biology 33 in the summer of 2018 and have been utilizing them in the last two semesters as well as the current semester in that course. The cost to the students dropped by over 75% while student success, measured using only passing rate as a criterion, remained at a nearly equivalent 77% (versus the historical 75% rate). Utilizing the existing text and lab manual as a springboard, I will use the time granted by the sabbatical to create a text and laboratory manual commensurate with the more complex curricula in the Biology 67A and 67B courses.

3. The third goal is to provide a more consistent lecture component across the Biology 33, Biology 67A, and Biology 67B labs. This requires the design, development, and recording of lectures that can be viewed ahead of the scheduled laboratory periods. In addition to incorporating QLT design principles, accomplishing this goal will allow students more time *in* lab to study. Pre-and post-lab assessments must also be redesigned and developed. Accomplishing this objective:

   I have already provided the instructors (both teaching assistants and part-time faculty) with lectures in PowerPoint format; however, the knowledge base of the instructors varies, not only within each semester but also across semesters. As in the first goal, I am aware of the techniques to succeed in this goal. I have already developed online pre- and post-lab quizzes to assist in learning, but those are tied to an expensive lab manual and in order to conform to Goal 2 they must be completely redesigned.

Demonstration of the necessity of a sabbatical leave:

The time required to revise, record, and implement the flipped format lectures to meet the CSU QLT guidelines will be considerable and the sabbatical leave provides uninterrupted time to develop goals 1 through 3 in an integrated manner. In addition, my experience writing the text and lab manual for Biology 33 has made it extremely clear that an extended focus is required to peruse online sources (e.g., OpenStax) to determine whether or not the content is appropriate and necessary for the course as well as to establish whether online content can be utilized within the goal of reducing student costs. The efforts above will be supplemented by redesigning all pre- and post-lab quizzes and designing reading assessments. All

three goals can be met within the semester leave requested as I will have already developed the "bare bones" of the course redesign and texts.

Travel Required:
Not applicable.

Section 2. Benefits to Karen M. Chooljian as a faculty member

- Provides an opportunity to use the guidelines of the CSU QLT to develop and organize the curricula in my courses to meet the guidelines and advance my teaching capabilities.
- Improve my ability to provide timely feedback to my students.
- Increased student success for my students.
- Lowered costs to the students in my courses.
- The opportunity to network with faculty in the CSU system that design and assess online content.

Section 3. Benefits to the university

- Improved curricula in three highly impacted courses to increase student success.
- Lowered costs to the students participating in these courses.
- The curriculum redesign could eventually lead to a set of fully online courses, allowing these impacted courses to reach more students and removing a "bottleneck" in their progression toward their degree.

Section 4. Previous leaves
I have not previously requested a sabbatical.