

Fall 2018

Principles of Biology I & II (GHC)

Kimberly Subacz

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Authors

Kimberly Subacz, Jacqueline Belwood, Karin Bennedsen, Lisa Branson, Tom Harnden, Sharryse Henderson, and Mark Knauss

Grants Collection

Georgia Highlands College



UNIVERSITY SYSTEM
OF GEORGIA

Jacqueline Belwood, Karin Bennedsen, Lisa Branson,
Thomas Harnden, Sharryse Henderson, Mark Knauss,
and Kimberly Subacz

Principles of Biology

I & II





Grants Collection

Affordable Learning Georgia Grants Collections are intended to provide faculty with the frameworks to quickly implement or revise the same materials as a Textbook Transformation Grants team, along with the aims and lessons learned from project teams during the implementation process.

Each collection contains the following materials:

- **Linked Syllabus**
 - The syllabus should provide the framework for both direct implementation of the grant team's selected and created materials and the adaptation/transformation of these materials.
- **Initial Proposal**
 - The initial proposal describes the grant project's aims in detail.
- **Final Report**
 - The final report describes the outcomes of the project and any lessons learned.



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Initial Proposal

Application Details

Manage Application: Textbook Transformation Grants: Round Eleven

Award Cycle: Round 11

Internal Submission Deadline: Tuesday, January 23, 2018

Application Title: 370

Application ID: 002094

Submitter First Name: Sharryse

Submitter Last Name: Henderson

Submitter Title: Professor of Biology

Submitter Email Address: shenders@highlands.edu

Submitter Phone Number: 678-872-8112

Submitter Campus Role: Other

Applicant First Name: Jacqueline

Applicant Last Name: Belwood

Applicant Email Address: jbelwood@highlands.edu

Applicant Phone Number: 678-872-8416

Primary Appointment Title: Associate Professor of Biology

Institution Name(s): Georgia Highlands College

Co-Applicant(s): Kimberly Subacz

Submission Date: Tuesday, January 23, 2018

Proposal Title: 370

Proposal Category: OpenStax Textbooks

Final Semester of Instruction: Fall 2018

Are you using an OpenStax textbook?: No

Team Members (Name, Email Address):

Jacqueline Belwood, Associate Professor of Biology, jbelwood@highlands.edu

Kimberly Subacz, Instructor of Biology, ksubacz@highlands.edu

Lisa Branson, Associate Professor of Biology, lbranson@highlands.edu

Thomas Harnden, Professor of Biology, tharnden@highlands.edu

Mark Knauss, Professor of Biology, mknauss@highlands.edu

Sharryse Henderson, Professor of Biology, shenders@highlands.edu

Karin Bennedsen, Assistant Librarian of Public Services, kbenneds@highlands.edu

Sponsor, (Name, Title, Department, Institution):

Renva Watterson, Ed.D.

Vice President of Academic Affairs

Georgia Highlands College

Course Names, Course Numbers and Semesters Offered:

BIOL 2107K - Principles of Biology I - offered every fall, spring, and summer semesters

BIOL 2108K - Principles of Biology II - offered every fall, spring and summer semesters

List the original course materials for students (including title, whether optional or required, & cost for each item): Required: Campbell Biology, 11th edition; plus MasteringBiology with Pearson eText - Access Card Package; ISBN 13: 978-0-13-408231-8 Estimated Cost: \$247

Average Number of Students per Course Section: 24

Number of Course Sections Affected by Implementation in Academic Year: 22

Average Number of Students Per Summer Semester: 96

Average Number of Students Per Fall Semester: 192

Average Number of Students Per Spring Semester: 204

Total Number of Students Affected by Implementation in Academic Year: 528

Requested Amount of Funding: \$30,000

Original per Student Cost: \$247

Post-Proposal Projected Student Cost: \$0

Projected Per Student Savings: \$247

Projected Total Annual Student Savings: \$130,416

Creation and Hosting Platforms Used ("n/a" if none):

D2L Brightspace

MERLOT II

GALILEO Open Learning Materials website

LibGuides via USG Libraries

Project Goals:

The United States Public Interest Research Group (USPIRG) surveyed college students across the US and concluded that the rising cost of college textbooks has a direct impact on student enrollment in, and progression through, college (1). In their report, *Fixing the Broken Textbook Market*, 65% of those surveyed decided not to purchase a textbook for at least one class and of those students, 94% believed that not purchasing a textbook would hurt their grade. Nearly half the students surveyed stated that the price of textbooks directly impacted their decision regarding the number and type of courses in which to enroll. Studies have also shown a correlation between not purchasing textbooks and increased likelihood of failure or withdrawal from courses (2). Furthermore, the Bureau of Labor Statistics reports that the cost of college textbooks has risen three times faster than the rate of inflation in the last 30 years - far outpacing health care expenses and home prices (3). Exacerbating this issue is the fact that only five publishers currently control 85% of the textbook market and the majority of publishers market textbooks to faculty rather than to the students who face numerous financial barriers to success in college (4). Obviously, there is a great need to remove the barriers that students face in pursuing higher education particularly in STEM courses.

In this project, we propose to engage in a department-wide effort to transform two of our gateway STEM courses, Principles of Biology I (BIOL 2107K) and Principles of Biology II (BIOL 2108K). In the lecture component of the course, we will adopt OpenStax *Biology* and

produce supporting instructional learning materials such as chapter outlines, detailed lecture PowerPoints (currently not available through OpenStax), and guided reading activities. In short, this project strives to improve student access to outstanding course materials thereby reducing one of the many barriers students face to achieve academic success.

Our project goals are to:

Identify and adopt an appropriate Open Educational Resource (OER) to best compliment student-learning outcomes for BIOL 2107K and BIOL 2108K. Preference will be given to OpenStax *Biology* for the lecture component of the course.

Redesign current ancillary materials for BIOL 2107K and BIOL 2108K using the OER framework (images, tables, etc.). When needed, purchase copyright-free images from on-line sources and/or create new images using one or more graphic designers from among GHC students, faculty, or staff.

Create supplemental course materials to support instruction with the new OER. Supplemental course materials will include chapter outlines, detailed instructional PowerPoints, and guided reading activities.

Create a complementary LibGuide for both BIOL 2107K and BIOL 2108K. Each LibGuide will serve as a repository for any instructional materials created as part of this grant but also house links to videos, animations, tutorials and other ancillary materials that faculty currently use in the instruction of their courses.

Improve student success in BIOL 2107K and BIOL 2108K and reduce drop/fail/withdraw (DFW) rates in courses that currently have among the highest DFW rates at GHC.

Increase retention, progression, and graduation (RPG) rates of STEM students at Georgia Highlands College.

Survey students enrolled in the redesigned courses and faculty who teach them to assess adopted OERs with regard to 1) convenience and ease-of-use, 2) effectiveness and quality, and 3) attainment of student-learning outcomes.

Statement of Transformation:

Georgia Highlands College (GHC) is a limited four-year college in the University System of Georgia that serves more than 6000 students in northwest Georgia and Northeast Alabama. GHC offers transfer associate degree programs, career associate degree programs, and targeted baccalaureate degree programs as well as instruction on five diversified campuses, which provides the opportunity to develop, implement, and compare new teaching materials and pedagogies across campuses.

Mean annual household income in the geographic areas served by GHC is about \$61,927 (5). According to the 2015-2016 Georgia Highlands College Fact Book, the average student at GHC is a 23.9 year-old female. Moreover, approximately 45.4% of GHC students are eligible for Pell Grant and many of our students have full-time jobs in addition to undertaking a full course load of at least 12 hours (6). Low-cost course materials will increase access to STEM

courses taught at GHC and should lead to a higher rate of utilization of the resources (7). Currently, most sections of BIOL 2107K and BIOL 2108K use proprietary textbooks at a cost of over \$247 for each student. Furthermore, students who use the electronic version of the textbook lose access to it after 12 months. The price of course materials makes these courses an unnecessarily expensive barrier to the first years of college rather than a valued entry level science course that builds study skills. This course transformation will save students at Georgia Highlands College over \$130,416 and provide them with a valuable, peer-reviewed, up-to-date textbook at no-cost and ancillary instructional materials that complement the textbook that have been fully vetted through GHC faculty.

BIOL 2107K and BIOL 2108K constitute a science sequence in Area D for all STEM majors and serves as an option for non-STEM majors to complete their Area D science requirements. Both courses are offered in fall, spring, and summer semesters at three of the five Georgia Highlands College instructional sites. Currently both are offered in a face-to-face environment only. Therefore, course materials will be designed to enhance innovative face-to-face instruction techniques such as the flipped-classroom design and active learning modules. Additionally, the primary student-learning outcomes of BIOL 2107K and BIOL 2108K are to improve student understanding of the basic concepts of biology and biochemistry (cell theory, cell structure, cell metabolism and cell reproduction) before proceeding to a detailed study of the evolution and diversity of life, comparative anatomy and physiology of body systems, and ecology. A major part of accomplishing these student-learning outcomes and developing related course materials is the use of current technologies. The Pearson Student Mobile Device Survey published in 2015 suggests 8 out of 10 college students surveyed use smartphones and other electronic devices in class on a regular basis (8). College students are more likely this year than last to feel that tablets make learning more fun (79%) and help students perform better in class (68%). Both of these measures are up significantly from last year (74% and 62%, respectively). This project will address the increasing use of technology by students by creating LibGuides to distribute all grant-generated course materials electronically and to house links to numerous online instructional aids such as videos, animations, and tutorials currently available online. Moreover, the LibGuides will provide instructors a more effective means to engage students, administer course content, and assist students in gaining a deeper understanding of the key principles being taught.

Transformation Action Plan:

The action plan will consist of adoption and adaptation of OpenStax *Biology* and the creation of supporting instructional materials. Quantitative and qualitative data will be collected to determine the efficacy of the OpenStax *Biology* and grant-created materials. The following activities will be conducted during the project to support implementation:

Approval: Team members will submit a formal proposal to the GHC Institutional Review Board (IRB). Pre- and post-course surveys will be generated and presented to the IRB for approval prior to administration. Semester updates and a final report will be submitted to the IRB so that

the college is fully informed about the progress and impact of this project.

Training: Team members will participate in various forms of training prior to and during implementation of this project. At least two team members will travel to Macon to attend the Kick-Off Meeting. Team members will participate in webinars hosted by USG staff on the Galileo Open Learning Materials repository. Team members will receive training from and collaborate with OpenStax staff. Team members will view archived videos from adaptive and authoring software companies available on the ALG Textbook Transformation website in order to identify appropriate software sources and prepare for the creation of multimedia instructional resources. Graphic artists will receive training on Adobe software available through a site license held by GHC.

Review and Selection: Although preference will be given to OpenStax *Biology* in the lecture component of the course, other OERs may be considered for adoption and adaption if individual content needs to be developed to meet current student-learning outcomes. Other possible sources for acceptable OERs may include Merlot II, Saylor Academy, GALILEO, Lumen Learning, CNX, Cool4Ed, and others. Final decision will be made on the basis of current student-learning outcomes for the transformed course(s), applicability in the classroom, and teaching experience of team members.

Evaluation of Selected OER: Once an appropriate OER is selected, we will examine how and if these materials can be used in both lecture and lab settings. Materials will then be organized into various areas of specialty and assigned to individual team members for review. Team members will determine if the content area needs to be adapted or if additional resources need to be created.

Adaptation and Creation: Each team member will adapt instructional materials in the content areas to which they are assigned. Any instructional materials found to be lacking, will be created and then evaluated by the team.

Course Syllabi: Master syllabi for each course will be created and made available to faculty and students on D2L. The master syllabi will 1) provide consistency of instruction and assessment in all sections of the course, 2) provide clear instructions on how to access newly created course materials, 3) provide a list of assigned readings and associated deadlines from the OER textbook, and 4) a list of assigned multimedia videos/animations and dates of use.

Course Evaluation/Redesign: After use of OER and newly created instructional materials begin, the team will evaluate the effectiveness of the new materials and feasibility for students. This will include 1) a comparison of grades from semesters the previous textbook was used and during the incorporation of OER materials and 2) distribution of surveys to determine how students and faculty feel about the implementation and use of the OER and associated materials. It will also include adjustments in the course material and syllabi, omission of unnecessary material, and creation/adoption of new material where needed.

Hosting: All course materials developed in support of the ALG Textbook Transformation project will be stored within a master course on GHC's learning management system, currently Brightspace by D2L (<http://www.brightspace.com>). This will allow all GHC instructors who teach BIOL 2107K and BIOL 2108K to have free and unrestricted access for use in their courses. Furthermore, newly developed course materials will be uploaded to LibGuides by SpringShare (<http://springshare.com/libguides>), which serves as a comprehensive content management system used by thousands of libraries worldwide, and MERLOT II (www.merlot.org), a curated collection of free and open online teaching, learning, and faculty development services contributed and used by an international education community. Finally, at the conclusion of this ALG project, all newly developed course materials will be posted on the GALILEO Open Learning Materials website (<http://oer.galileo.usg.edu/>). Consequently, any student enrolled in BIOL 2107K and BIOL 2108K and any faculty at GHC, within the USG, or across the country or internationally will have 24-hour-access to our OERs and ancillary materials.

The following team members will play an active role in implementing the transformation action plan:

Jacqueline Belwood: Principle Investigator; will oversee project from start to finish including: assist in development of grant proposal, identification, and adoption of appropriate OERs, development of relate course materials; and creation of a master syllabus. She will also serve as a curriculum expert for both BIOL 2107K and BIOL 2108K.

Kimberly Subacz: Co-PI; will oversee project from start to finish including: assist in development of grant proposal, identification, and adoption of appropriate OERs, development of relate course materials; and creation of a master syllabus. She will also serve as a curriculum expert for both BIOL 2107K and BIOL 2108K.

Mark Knauss: Curriculum expert; will develop and/or modify open source ancillary materials to complement the selected OER in BIOL 2108K. These ancillary materials include but are not limited to chapter outlines, Powerpoints, and guided reading activities.

Lisa Branson: Curriculum expert; will develop and/or modify open source ancillary materials to complement the selected OER in BIOL 2108K. These ancillary materials include but are not limited to chapter outlines, Powerpoints, and guided reading activities.

Tom Harnden: Instructional designer; provide expertise in online instruction and online course development; assist with administration of surveys and data collection. He will also serve as a curriculum expert for BIOL 2108K

Karin Bennedsen: Library Support Staff; will collaborate with team members to identify and adopt OERs and make OER materials created during this project freely accessible on LibGuides, MERLOT II, Galileo Open Learning Materials.

Sharryse Henderson: Grant administrator and research analyst;

provide administrative support, writing and development of grant proposal, submission of application, administration of surveys, data collection and analysis, submission of progress report and final report, and provide expertise in carrying out the grant plan of action.

Quantitative & Qualitative Measures: Both quantitative and qualitative methods will be used to measure and gauge the success of our transition from the use of proprietary course materials to OpenStax Biology and no-cost ancillary materials. Quantitative data from 1) success rates on embedded assessment questions on the final exam, 2) DFW rates, and 3) RPG rates for semesters during which traditional texts were used in BIOL 2107K and 2108K will be compared to rates for the transformed courses. Furthermore, usage data will be gathered from the D2L content usage tool to determine how often students are accessing OpenStax Biology textbook. Qualitative methods will consist of pre- and post-course surveys that measure the number of students who use the textbook, the frequency in which they believe they access the textbook, the ways in which they use the textbooks, and reasons they accessed the textbook. Students will also be asked to compare their experiences in the redesigned course compared to classes using traditional texts. Similarly, pre- and post-course surveys will quantify faculty use of, and any problems associated with, the open source textbooks. Faculty will also be asked to provide detailed qualitative critiques of the new ancillary materials adopted/created for each course. An optional discussion forum on D2L will also be devised to elicit additional qualitative feedback from students with regard to ease of material access and use -- including text design, quality and readability, and appropriateness of ancillary materials. All qualitative and quantitative data will be compiled, analyzed and presented in a mid-project report and final project report.

Timeline:

<p>Spring 2018</p>	<ul style="list-style-type: none"> • Attend required “Kick Off” Meeting • Review and adopt OpenStax <i>Biology</i> textbook or other appropriate OERs • Identify topics/concepts that require adaptation and creation of supplemental materials • Grant team members participate in training with OpenStax staff, attend webinar(s) hosted by USG staff on the use of Galileo Open Learning Materials website, and view archived web events offered by adaptive and authoring software companies • Identify Graphic Designers from among GHC students, faculty or staff • Begin to create BIOL 2107K and BIOL 2108K ancillary materials and instructional resources
<p>Summer 2018</p>	<ul style="list-style-type: none"> • Redesign BIOL 2107K and BIOL 2108K master syllabi for OpenStax Biology textbook • Continue development of BIOL 2107K and BIOL 2108K instructional materials for lecture components of the courses • Develop pre- and post-course surveys for students and methodology for delivery and analytics • Meet with all full-time and part-time biology faculty staff to train and prepare for implementation of Openstax <i>Biology</i> textbook and all newly created ancillary materials • Upload newly created course materials into the college’s Learning Management System (D2L) for dissemination and delivery to division faculty and students

Fall 2018	<ul style="list-style-type: none"> • Conduct BIOL 2107K and BIOL 2108K courses using OpenStax <i>Biology</i> textbook and newly created instructional materials • Administer student pre- and post-surveys • Revise and edit instructional materials based on student and faculty feedback • Compile and analyze Fall 2018 data at the conclusion of the semester • Generate final report to summarize study findings • Upload newly created instructional materials to MERLOT II, OpenStax CNS, and Galileo Open Learning Materials repository
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Budget:

We are requesting funding according to the Large-Scale Transformation category for department-wide adoption of OER textbook or for sections with enrollments of 500 students or more per academic year. The total funds requested to support this project are **\$30,000**.

Release Time for Faculty - \$15,000 TOTAL

Jacqueline Belwood, Associate Professor of Biology and Principal Investigator: \$5000

Kimberly Subacz, Instructor of Biology and Principal Investigator: \$5000

Mark Knauss, Professor of Biology and Content Expert: \$1500

Lisa Branson, Associate Professor of Biology and Content Expert: \$3500

Staff Support - \$11,200 TOTAL

Tom Harnden, Professor of Biology and Instructional Designer: \$1000

Sharryse Henderson, Professor of Biology and Grant Administrator: \$3700

Karin Bennedsen, Assistant Librarian at Paulding Campus: \$500

TBA, Graphic Designers: \$6000

Technology - \$3000 TOTAL

Computer programs and Internet aids to support graphic designers: \$1000

Shutterstock for purchase of stock images: \$2000 (1 year subscription @ \$169/month)

Travel to Grant Kick-Off Meeting - \$800 TOTAL

Jacqueline Belwood, Associate Professor of Biology and Principal Investigator: \$400

Kimberly Subacz, Instructor of Biology and Co-PI: \$400

Sustainability Plan:

Principles of Biology I (2107K) and II (2108K) is offered every semester at GHC, as they fulfill the Area D lab science requirement for both STEM and non-STEM majors. All course materials generated by funding from this grant will be made freely available under the Creative Commons license for public access and usage. Course materials will be reviewed annually (three times per year January, May, September) and any needed updates will be made. Surveys will be conducted each semester to determine student satisfaction and recommended improvements will be made as needed. In addition, we will contribute to the quality of the OpenStax project by continuing to monitor and report any and all errors found in the OpenStax *Biology* textbook to the editor-in-chief (David Harris). Once the transformation of BIOL 2107K/2108K is complete, we will explore the possibility of expanding some of the successful changes to other courses at GHC including ASTR, GEOL, PHYS, and ENV5. These courses are also frequently taken by both STEM and non-STEM majors to fulfill the Area D science requirements but currently have high-cost textbooks and lab manuals rather than OERs.

GEORGIA HIGHLANDS



COLLEGE

FLOYD CAMPUS
3175 Cedartown Highway
Rome, GA 30161

VICE PRESIDENT
FOR ACADEMIC AFFAIRS

January 22, 2018

Dear ALG Grants Committee Members:

I am pleased to write this letter in support of this splendid group of Natural Science and Physical Education professors, as they seek grant funding to incorporate free and open texts and other instructional materials for two courses, BIOL 2107K and BIOL 2108K. There are numerous reasons of efficiency, pedagogy, and instructional transformation which compel me to support this initiative.

First, this outstanding team of collegiate educators will engage in a thoughtful process that will broadly affect the student body at Georgia Highlands College. We expect to affect approximately 500 students per year through redesign of these courses. Specifically, it would directly impact about 8% of our entire college population.

Second, money saved through this plan's implementation would provide opportunity for enhanced teaching and learning. Case in point, with textbook costs rising at an unheard of rate, our students could be saving nearly \$131,000 by replacing current textbooks with open educational resources and through the generation of open learning materials that will be freely available to all students. We know this affects our students' foundational learning, tenacity, and ability to thrive in this class.

Finally, this affordable learning grant will serve as a catalyst for enhanced teaching and learning. It will serve as a springboard for innovation on the part of faculty who work to make those materials more creative, applied, and relevant in today's biology classrooms. It will send the message that GHC faculty members care about their students economically, socially, and intellectually. It will urge students to persist and to complete in a discipline that too often is a stumbling block to college completion.

I wholeheartedly endorse this ALG Transformation Grant application from these forward-thinking, action-oriented professors. Their plan is noteworthy and laudable. Please allow them to continue their essential work through the approval of the grant.

Sincerely,

Renva Watterson, Ed.D.

highlands.edu

Affirmative Action / Equal Employment and Educational Opportunity Institution

CARTERSVILLE CAMPUS
678-872-8000

DOUGLASVILLE SITE
678-872-4200

FLOYD CAMPUS
706-802-5000

MARIETTA SITE
678-872-8501

PAULDING SITE
678-946-1100

**Affordable Learning Georgia Textbook Transformation Grants
Rounds Ten and Eleven
For Implementations beginning Spring Semester 2018
Running Through Fall Semester 2018**

Proposal Form and Narrative

Submitter Name	Sharryse Henderson
Submitter Title	Professor of Biology
Submitter Email	shenders@highlands.edu
Submitter Phone Number	678-872-8112
Submitter Campus Role	Other: Science Coordinator
Applicant Name	Jacqueline Belwood, Ph.D.
Applicant Email	jbelwood@highlands.edu
Applicant Phone Number	678-872-8416
Primary Appointment Title	Associate Professor of Biology
Institution Name(s)	Georgia Highlands College
Team Members	<p>Kimberly Subacz, Instructor of Biology, Division of Natural Science and Physical Education, Georgia Highlands College, ksubacz@highlands.edu</p> <p>Lisa Branson, Associate Professor of Biology, Division of Natural Science and Physical Education, Georgia Highlands College, lbranson@highlands.edu</p> <p>Sharryse Henderson, Professor of Biology, Division of Natural</p>

	<p>Science and Physical Education, Georgia Highlands College, shenders@highlands.edu</p> <p>Thomas Harnden, Ph.D., Professor of Biology, Division of Natural Science and Physical Education, Georgia Highlands College, tharnden@highlands.edu</p> <p>Mark Knauss, Ph.D., Professor of Biology, Division of Natural Science and Physical Education, Georgia Highlands College, mknauss@highlands.edu</p> <p>Karin Bennedsen, Assistant Librarian of Public Services, Paulding Instructional Site, Georgia Highlands College, kbernde@highlands.edu</p>				
Sponsor, Title, Department, Institution	Renva Watterson, Ed.D., Vice President, Academic Affairs, Georgia Highlands College				
Proposal Title	ALG Textbook Transformation Project to Adopt an Open Educational Resource by OpenStax for Principles of Biology I and II (BIOL 2107K and 2108K) at Georgia Highlands College.				
Course Names, Course Numbers and Semesters Offered	BIOL 2107K – Principles of Biology I and BIOL 2108K – Principles of Biology II. Both courses are intended for STEM majors and are offered in fall, spring, and summer semesters. Project will begin Spring 2018 and conclude Fall 2018				
Final Semester of Instruction	Fall 2018				
Average Number of Students Per Course Section	24	Number of Course Sections Affected by Implementation in Academic Year	22	Total Number of Students Affected by Implementation in Academic Year	528
Average Number of Students Per Summer Semester	96				

Average Number of Students Per Fall Semester	192
Average Number of Students Per Spring Semester	240
Award Category (pick one)	<input checked="" type="checkbox"/> No-or-Low-Cost-to-Students Learning Materials <input type="checkbox"/> Specific Core Curriculum Courses
Are you planning on using an OpenStax textbook?	<input checked="" type="checkbox"/> Yes <input type="checkbox"/> No
List the original course materials for students (including title, whether optional or required, & cost for each item)	<p><u>REQUIRED COMPONENTS:</u></p> <p><i>Campbell Biology</i>, 11th edition; Plus MasteringBiology with Pearson eText -- Access Card Package; ISBN 13: 978-0-13-408231-8; Estimated Cost: \$247</p>
Requested Amount of Funding	\$30,000
Original Per Student Cost	\$247
Post-Proposal Projected Per Student Cost	\$0
Projected Per Student Savings	\$247

Projected Total Annual Student Savings	\$130,416
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NARRATIVE

1.1 PROJECT GOALS

The United States Public Interest Research Group (USPIRG) surveyed college students across the US and concluded that the rising cost of college textbooks has a direct impact on student enrollment in, and progression through, college (1). In their report, *Fixing the Broken Textbook Market*, 65% of those surveyed decided not to purchase a textbook for at least one class and of those students, 94% believed that not purchasing a textbook would hurt their grade. Nearly half the students surveyed stated that the price of textbooks directly impacted their decision regarding the number and type of courses in which to enroll. Studies have also shown a correlation between not purchasing textbooks and increased likelihood of failure or withdrawal from courses (2). Furthermore, the Bureau of Labor Statistics reports that the cost of college textbooks has risen three times faster than the rate of inflation in the last 30 years - far outpacing health care expenses and home prices (3). Exacerbating this issue is the fact that only five publishers currently control 85% of the textbook market and the majority of publishers market textbooks to faculty rather than to the students who face numerous financial barriers to success in college (4). Obviously, there is a great need to remove the barriers that students face in pursuing higher education particularly in STEM courses.

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Our project goals are to:

- Identify and adopt an appropriate Open Educational Resource (OER) to best compliment student-learning outcomes for BIOL 2107K and BIOL 2108K. Preference will be given to OpenStax *Biology* for the lecture component of the course.
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- Create a complementary LibGuide for both BIOL 2107K and BIOL 2108K. Each LibGuide will serve as a repository for any instructional materials created as part of this grant but also house links to videos, animations, tutorials and other ancillary materials that faculty currently use in the instruction of their courses.
- Improve student success in BIOL 2107K and BIOL 2108K and reduce drop/fail/withdraw (DFW) rates in courses that currently have among the highest DFW rates at GHC.

- Increase retention, progression, and graduation rates of STEM students at Georgia Highlands College.
- Survey students enrolled in the redesigned courses and faculty who teach them to assess adopted OERs with regard to 1) convenience and ease-of-use, 2) effectiveness and quality, and 3) attainment of student-learning outcomes.

1.2 STATEMENT OF TRANSFORMATION

Georgia Highlands College (GHC) is a limited four-year college in the University System of Georgia that serves more than 6000 students in northwest Georgia and Northeast Alabama. GHC offers transfer associate degree programs, career associate degree programs, and targeted baccalaureate degree programs as well as instruction on five diversified campuses, which provides the opportunity to develop, implement, and compare new teaching materials and pedagogies across campuses.

Mean annual household income in the geographic areas served by GHC is about \$61,927 (5). According to the 2015-2016 Georgia Highlands College Fact Book, the average student at GHC is a 23.9 year-old female. Moreover, approximately 45.4% of GHC students are eligible for Pell Grant and many of our students have full-time jobs in addition to undertaking a full course load of at least 12 hours (6). Low-cost course materials will increase access to STEM courses taught at GHC and should lead to a higher rate of utilization of the resources (7). Currently, most sections of BIOL 2107K and BIOL 2108K use proprietary textbooks at a cost of over \$247 for each student. Furthermore, students who use the electronic version of the textbook lose access to it after 12 months. The price of course materials makes these courses an unnecessarily expensive barrier to the first years of college rather than a valued entry level science course that builds study skills. This course transformation will save students at Georgia Highlands College over \$130,416 and provide them with a valuable, peer-reviewed, up-to-date textbook at no-cost and ancillary instructional materials that complement the textbook that have been fully vetted through GHC faculty.

BIOL 2107K and BIOL 2108K constitute a science sequence in Area D for all STEM majors and serves as an option for non-STEM majors to complete their Area D science requirements. Both courses are offered in fall, spring, and summer semesters at three of the five Georgia Highlands College instructional sites. Currently both are offered in a face-to-face environment only. Therefore, course materials will be designed to enhance innovative face-to-face instruction techniques such as the flipped-classroom design and active learning modules. Additionally, the primary student-learning outcomes of BIOL 2107K and BIOL 2108K are to improve student understanding of the basic concepts of biology and biochemistry (cell theory, cell structure, cell metabolism and cell reproduction) before proceeding to a detailed study of the evolution and diversity of life, comparative anatomy and physiology of body systems, and ecology. A major part of accomplishing these student-learning outcomes and developing related course materials is the use of current technologies. The Pearson Student Mobile Device Survey published in 2015 suggests 8 out of 10 college students surveyed use smartphones and other electronic devices in class on a regular basis (8). College students are more likely this year than last to feel that tablets make learning more fun (79%) and help students perform better in class (68%). Both of these measures are up significantly from last year (74% and 62%, respectively). This project will address the increasing use of technology by students by creating LibGuides to distribute all grant-generated course materials electronically and to house links to numerous online instructional aids such as videos, animations, and tutorials currently available online. Moreover, the LibGuides will provide instructors a more effective means to engage students, administer

course content, and assist students in gaining a deeper understanding of the key principles being taught.

1.3 TRANSFORMATION ACTION PLAN

The action plan will consist of adoption and adaptation of OpenStax *Biology* and the creation of supporting instructional materials. Quantitative and qualitative data will be collected to determine the efficacy of the OpenStax *Biology* and grant-created materials. The following activities will be conducted during the project to support implementation:

Approval: Team members will submit a formal proposal to the GHC Institutional Review Board (IRB). Pre- and post-course surveys will be generated and presented to the IRB for approval prior to administration. Semester updates and a final report will be submitted to the IRB so that the college is fully informed about the progress and impact of this project.

Training: Team members will participate in various forms of training prior to and during implementation of this project. At least two team members will travel to Macon to attend the Kick-Off Meeting. Team members will participate in webinars hosted by USG staff on the Galileo Open Learning Materials repository. Team members will receive training from and collaborate with OpenStax staff. Team members will view archived videos from adaptive and authoring software companies available on the ALG Textbook Transformation website in order to identify appropriate software sources and prepare for the creation of multimedia instructional resources. Graphic artists will receive training on Adobe software available through a site license held by GHC.

Review and Selection: Although preference will be given to OpenStax *Biology* in the lecture component of the course, other OERs may be considered for adoption and adaption if individual content needs to be developed to meet current student-learning outcomes. Other possible sources for acceptable OERs may include Merlot II, Saylor Academy, GALILEO, Lumen Learning, CNX, Cool4Ed, and others. Final decision will be made on the basis of current student-learning outcomes for the transformed course(s), applicability in the classroom, and teaching experience of team members.

Evaluation of Selected OER: Once an appropriate OER is selected, we will examine how and if these materials can be used in both lecture and lab settings. Materials will then be organized into various areas of specialty and assigned to individual team members for review. Team members will determine if the content area needs to be adapted or if additional resources need to be created.

Adaptation and Creation: Each team member will adapt instructional materials in the content areas to which they are assigned. Any instructional materials found to be lacking, will be created and then evaluated by the team.

Course Syllabi: Master syllabi for each course will be created and made available to faculty and students on D2L. The master syllabi will 1) provide consistency of instruction and assessment in all sections of the course, 2) provide clear instructions on how to access newly created course materials, 3) provide a list of assigned readings and associated deadlines from the OER textbook, and 4) a list of assigned multimedia videos/animations and dates of use.

Course Evaluation/Redesign: After use of OER and newly created instructional materials begin, the team will evaluate the effectiveness of the new materials and feasibility for students. This will include 1) a comparison of grades from semesters the previous textbook was used and during the incorporation of OER materials and 2) distribution of surveys to determine how students and faculty feel about the implementation and use of the OER and associated materials. It will also include adjustments in the course material and syllabi, omission of unnecessary material, and creation/adoption of new material where needed.

Hosting: All course materials developed in support of the ALG Textbook Transformation project will be stored within a master course on GHC's learning management system, currently Brightspace by D2L (<http://www.brightspace.com>). This will allow all GHC instructors who teach BIOL 2107K and BIOL 2108K to have free and unrestricted access for use in their courses. Furthermore, newly developed course materials will be uploaded to LibGuides by SpringShare (<http://springshare.com/libguides>), which serves as a comprehensive content management system used by thousands of libraries worldwide, and MERLOT II (www.merlot.org), a curated collection of free and open online teaching, learning, and faculty development services contributed and used by an international education community. Finally, at the conclusion of this ALG project, all newly developed course materials will be posted on the GALILEO Open Learning Materials website (<http://oer.galileo.usg.edu/>). Consequently, any student enrolled in BIOL 2107K and BIOL 2108K and any faculty at GHC, within the USG, or across the country or internationally will have 24-hour-access to our OERs and ancillary materials.

The following team members will play an active role in implementing the transformation action plan:

- **Jacqueline Belwood:** Principle Investigator; will oversee project from start to finish including: assist in development of grant proposal, identification and adoption of appropriate OERs, development of related course materials; and creation of a master syllabus. She will also serve as a curriculum expert for both BIOL 2107K and BIOL 2108K.
- **Kimberly Subacz:** Co-PI; will oversee project from start to finish including: assist in development of grant proposal, identification and adoption of appropriate OERs, development of related course materials; and creation of a master syllabus. She will also serve as a curriculum expert for both BIOL 2107K and BIOL 2108K.
- **Mark Knauss:** Curriculum Expert; will develop and/or modify open source ancillary materials to compliment the selected OER in BIOL 2107K. These ancillary materials include but are not limited to chapter outlines, PowerPoints, and guided reading activities.

- **Lisa Branson:** Curriculum Expert; will develop and/or modify open source ancillary materials to compliment the selected OER in BIOL 2108K. These ancillary materials include but are not limited to chapter outlines, PowerPoints, and guided reading activities.
- **Tom Harnden:** Instructional designer; provide expertise in online instruction and online course development; assist with administration of surveys and data collection. He will also serve as a curriculum expert for BIOL 2108K.
- **Karin Bennedsen:** Library Support Staff; will collaborate with team members to identify and adopt OERs and make OER materials created during this project freely accessible on LibGuides, Merlot II, and Galileo Open Learning Materials.
- **Sharryse Henderson:** Grant administrator and research analyst; provide administrative support, writing and development of grant proposal, submission of application, administration of surveys, data collection and analysis, submission of progress report and final report, and provide expertise in carrying out the grant plan of action.

1.4 QUANTITATIVE AND QUALITATIVE MEASURES

Both quantitative and qualitative methods will be used to measure and gauge the success of our transition from the use of proprietary course materials to OpenStax *Biology* and no-cost ancillary materials. Quantitative data from 1) success rates on embedded assessment questions on the final exam, 2) DFW rates, and 3) RPG rates for semesters during which traditional texts were used in BIOL 2107K and 2108K will be compared to rates for the transformed courses. Furthermore, usage data will be gathered from the D2L content usage tool to determine how often students are accessing OpenStax *Biology* textbook. Qualitative methods will consist of pre- and post-course surveys that measure the number of students who use the textbook, the frequency in which they believe they access the textbook, the ways in which they use the textbooks, and reasons they accessed the textbook. Students will also be asked to compare their experiences in the redesigned course compared to classes using traditional texts. Similarly, pre- and post-course surveys will quantify faculty use of, and any problems associated with, the open source textbooks. Faculty will also be asked to provide detailed qualitative critiques of the new ancillary materials adopted/created for each course. An optional discussion forum on D2L will also be devised to elicit additional qualitative feedback from students with regard to ease of material access and use -- including text design, quality and readability, and appropriateness of ancillary materials. All qualitative and quantitative data will be compiled, analyzed and presented in a mid-project report and final project report.

1.5 TIMELINE

Spring 2018	<ul style="list-style-type: none"> • Attend required “Kick Off” Meeting • Review and adopt OpenStax <i>Biology</i> textbook or other appropriate OERs • Identify topics/concepts that require adaptation and creation of supplemental materials • Grant team members participate in training with OpenStax staff, attend webinar(s) hosted by USG staff on the use of Galileo Open Learning Materials website, and view archived web events offered by adaptive and authoring software companies • Identify Graphic Designers from among GHC students, faculty or staff • Begin to create BIOL 2107K and BIOL 2108K ancillary materials and instructional resources
Summer 2018	<ul style="list-style-type: none"> • Redesign BIOL 2107K and BIOL 2108K master syllabi for OpenStax <i>Biology</i> textbook • Continue development of BIOL 2107K and BIOL 2108K instructional materials for lecture components of the courses • Develop pre- and post-course surveys for students and methodology for delivery and analytics • Meet with all full-time and part-time biology faculty staff to train and prepare for implementation of Openstax <i>Biology</i> textbook and all newly created ancillary materials • Upload newly created course materials into the college’s Learning Management System (D2L) for dissemination and delivery to division faculty and students
Fall 2018	<ul style="list-style-type: none"> • Conduct BIOL 2107K and BIOL 2108K courses using OpenStax <i>Biology</i> textbook and newly created instructional materials • Administer student pre- and post-surveys • Revise and edit instructional materials based on student and faculty feedback • Compile and analyze Fall 2018 data at the conclusion of the semester • Generate final report to summarize study findings • Upload newly created instructional materials to MERLOT II, OpenStax CNS, and Galileo Open Learning Materials repository

1.6 BUDGET

We are requesting funding according to the Large-Scale Transformation category for department-wide adoption of OER textbook or for sections with enrollments of 500 students or more per academic year. The total funds requested to support this project are **\$30,000**.

Release Time for Faculty - \$15,000 TOTAL

- Jacqueline Belwood, Associate Professor of Biology and Principal Investigator: \$5000
- Kimberly Subacz, Instructor of Biology and Principal Investigator: \$5000
- Mark Knauss, Professor of Biology and Content Expert: \$1500
- Lisa Branson, Associate Professor of Biology and Content Expert: \$3500

Staff Support - \$11,200 TOTAL

- Tom Harnden, Professor of Biology and Instructional Designer: \$1000
- Sharryse Henderson, Professor of Biology and Grant Administrator: \$3700
- Karin Bennedsen, Assistant Librarian at Paulding Campus: \$500
- TBA, Graphic Designers: \$6000

Technology - \$3000 TOTAL

- Computer programs and Internet aids to support graphic designers: \$1000
- Shutterstock for purchase of stock images: \$2000 (1 year subscription @ \$169/month)

Travel to Grant Kick-Off Meeting - \$800 TOTAL

- Jacqueline Belwood, Associate Professor of Biology and Principal Investigator: \$400
- Kimberly Subacz, Instructor of Biology and Principal Investigator: \$400

1.7 SUSTAINABILITY PLAN

Principles of Biology I (2107K) and II (2108K) is offered every semester at GHC, as they fulfill the Area D lab science requirement for both STEM and non-STEM majors. All course materials generated by funding from this grant will be made freely available under the Creative Commons license for public access and usage. Course materials will be reviewed annually (three times per year January, May, September) and any needed updates will be made. Surveys will be conducted each semester to determine student satisfaction and recommended improvements will be made as needed. In addition, we will contribute to the quality of the OpenStax project by continuing to monitor and report any and all errors found in the OpenStax *Biology* textbook to the editor-in-chief (David Harris). Once the transformation of BIOL 2107K/2108K is complete, we will explore the possibility of expanding some of the successful changes to other courses at GHC including ASTR, GEOL, PHYS and ENVS. These courses are also frequently taken by both STEM and non-STEM majors to fulfill the Area D science requirements but currently have high-cost textbooks and lab manuals rather than OERs.

1.8 REFERENCES & ATTACHMENTS

In addition to the attached Letter of Support, the following articles were cited in this proposal:

1. United States Public Interest Research Group. 2014. Available at:
<http://www.uspirg.org/sites/pirg/files/reports/NATIONAL%20Fixing%20Broken%20Textbooks%20Report1.pdf>
2. Florida Distance Learning Consortium. September, 2011. Florida Student Textbook Survey. Tallahassee, FL. Available at:
<http://www.openaccesstextbooks.org/projectInfo.html>
3. Bureau of Labor Statistics. 2015. Available at: <http://www.bls.gov/news.release/cpi.htm>
4. Everard, A. and St. Pierre, K. A Case for Student Adoption of Open Textbooks. Journal of the Academy of Business Education. 2014, 66-76.
5. United States Census Bureau – American Community Survey. 2015. Available at:
https://factfinder.census.gov/bkmk/navigation/1.0/en/d_dataset:ACS_15_5YR/d_product_type:DATA_PROFILE/
6. Georgia Highlands College Fact Book: Academic Year 2015-2016. Available at:
<https://sites.highlands.edu/paar/wp-content/uploads/sites/9/2017/03/201516factbook.pdf>
7. B.L. Lindshield and K. Adhikari, 2013, Online and Campus College Students Like Using an Open Educational Resource Instead of a Traditional Textbook MERLOT Journal of Online Learning and Teaching, 9(1), 26 – 38.
8. Pearson Student Mobile Device Survey. June 2015. Available at:
<https://www.pearsoned.com/wp-content/uploads/2015-Pearson-Student-Mobile-Device-Survey-College.pdf>

Syllabus



COURSE INFORMATION:

SEMESTER/YEAR:	
CRN#	
LECTURE DAY/TIME:	
LAB DAY/TIME:	
CREDIT HOURS:	

LECTURE INSTRUCTOR INFORMATION:

NAME:	
TITLE:	
EMAIL:	
OFFICE PHONE:	
OFFICE LOCATION:	
OFFICE HOURS:	

IMPORTANT CLASS DATES:

Drop/Add Period:	
Non-Attendance Reporting:	
Progress Reporting:	
Independence Break (no classes):	
Last day to withdraw with a "W":	
Last day of Class:	
Course Final Exam:	
Grades Due:	

COURSE DESCRIPTION:

Biology 2107K: Principles of Biology I

(3-3-4) Prerequisite: Satisfactory placement scores or successful completion of all learning support requirements. This course is designed for students in the biological sciences and pre-professional pathways. This course will investigate the history of science and the scientific method, the chemical basis of cells, cell biology, bioenergetics, DNA structure and function, general and molecular genetics, and the theories of natural selection and speciation. Students will be introduced to the recent trends in the biological sciences and will be required to research topics outside of the classroom. **Laboratory Fee.** *NOTE: Students may not receive credit for both BIOL 2107K and BIOL 1010K. [Georgia Highlands Catalog 2017-2018]

STUDENT LEARNING OUTCOMES FOR SCIENCE:

Georgia Highlands College Educational Effectiveness Goal for Science: Students will demonstrate knowledge of the fundamental concepts of at least one scientific discipline, and an understanding of the interplay between theory, experimentation, and observation undergirding those concepts.

Georgia Highlands College Student Learning Outcomes for Science: Students will demonstrate knowledge of the fundamental concepts of at least one scientific discipline, and an understanding of the interplay between theory and experimentation and observations undergirding those concepts.

1.	Students will demonstrate competency of one discipline in the sciences in terms of its informational content.
2.	Students will demonstrate competency of one discipline in the sciences in terms of its terminology.

3.	Students will demonstrate competency of one discipline in the sciences in terms of its commonly used units of measurement.
4.	Students will demonstrate the ability to operate basic instrumentation, gather data, analyze data, and generate conclusions in a laboratory or observational setting.
5.	Students will demonstrate the ability to apply discipline content to problem solving.

COURSE OBJECTIVES AND COMPETENCIES FOR BIOL 2107K:

Upon completion of this course, students should be able to:

1.	Define biology, identify and describe the characteristics of life, and explain the hierarchal organization of life.
2.	Identify and describe the scientific method and its process.
3.	Identify and describe basic principles of chemistry.
4.	Define organic chemistry and will identify major classes of organic compounds.
5.	Describe cell structure, identify organelles and describe their functions
6.	Describe the process of energy transfer in cells (i.e. photosynthesis, cellular respiration, role of enzymes).
7.	Discuss aspects of classical genetics including cell reproduction and Mendelian inheritance.
8.	Describe gene structure and function and explain the application of molecular genetics to biotechnology.
9.	Define evolution, identify and describe mechanisms of evolution, and will be able to identify the steps leading to the evolution of life on Earth.
10.	Operate basic instrumentation, gather data, analyze data, and generate conclusions in a laboratory or observational setting.
11.	Identify, research, and describe current events, issues, and research in biology.

REQUIRED TEXT:

Lecture: OpenStax College. Biology. 2018. Rice University. ISBN: 978-1-947172-51-7 (2nd edition)

Download for FREE at: <https://openstax.org/details/books/biology-2e>

Although the instructor provides detailed lecture notes, they are meant only to be a supplement to the above required text. Regularly reading your textbook is HIGHLY encouraged as exam questions are taken from the material in the textbook!!

Helpful links to for students will be on D2L in a folder entitled Extra Help. If students need additional help please see the [GHC 's tutorial center website](#) for a vast array of helpful services and links.

Lab: "In house" lab manual will be posted to D2L. Each student will need to print off their weekly lab assignment before class and bring materials to take notes.

TECHNICAL HELP:

If you have trouble accessing the course or any other technical issues associated with **Georgia View D2L** then please click on the following link and contact Vista technical help: <https://d2lhelp.view.usg.edu/>

If you have trouble and need to contact a **specific department at GHC** (e.g. eLearning), then you can click on <http://www.highlands.edu/site/ghc411>

ATTENDANCE POLICY:

Lecture: In any science course, there is a direct correlation between class participation and academic performance. Attendance will be recorded for advisory purposes and administrative record keeping. You will be given an individual page to sign each date you attend. Attendance will be monitored and can influence your grade. Any student missing more than 60% of scheduled class meetings (lecture and lab) will be awarded an F\$ for the semester [This symbol is for an unearned F, which indicates that the student stopped attending class and did not fill out appropriate paperwork to withdraw. This grade is computed in the grade point average as an F. A possible implication of an F\$ grade is repayment of any student financial aid money awarded.] Students must routinely log into D2L, check their highlands email daily, and course news announcements daily. It is the student's sole responsibility for obtaining all materials or announcements that were missed as a result of an absence.

Lab: Weekly attendance to the laboratory is required. Failure to attend laboratory during your normally scheduled lab time will result in the loss of all points associated with that particular lab. Due to the nature of the typical lab setting, there will be no make-up opportunities to earn lab points lost due to failure to attend!!

EXTENDED ABSENCE POLICY:

Students, who have circumstances that prevent them from continuing to attend classes over an extended period of time, sometimes request that the faculty member permit them to submit work in absentia to receive credit to complete the course. If the concurrent absences will constitute more than 15% of the class sessions for the term, then written permission from the Division Chair is required before any course assignments can be completed while missing class. The student must be in good academic standing in the course to make the request. All approved coursework must be completed by the end of the semester in which the course was begun. (Note: If a program has a more stringent absence policy than this, then the program policy prevails.)

INCLEMENT WEATHER POLICY:

In the event of weather related cancellation of classes, the schedule will pick up the sequence of lectures herein described as classes resume. The semester may then be extended, or double lectures designed as we go. If we have covered all material for a test, the test will be given on the first day back to class. If there is inclement weather, the college posts necessary announcements on www.highlands.edu. Cancellation notices for Floyd or Cartersville locations will be reported to radio stations and WXIA-TV in Atlanta. However, please be advised that station regulations may not allow for clarity in location-specific announcements such as "Georgia Highlands, Cartersville only." Generally speaking, stations simply broadcast something like "Georgia Highlands is closed." Classes in Paulding, Douglasville, or Marietta will be cancelled when, respectively, North Metro Technical College, University of West Georgia, or Kennesaw State University close. Policies for distance-learning courses relative to inclement weather are different. It is assumed that all distance-learning courses are considered accessible even during periods of inclement weather.

EVALUATION METHODS AND GRADING:

GRADE ITEM	POINTS EARNED	POINTS POSSIBLE	SCORE	% OF COURSE GRADE
Lecture exam one		75		10%
Comprehensive midterm exam		100		20%
Lecture exam three		75		10%
Comprehensive final exam		100		20%
Class participation		100		10%
Plasmid project valued at 100 points total		100		10%
Laboratory grade valued at 400 points		400		20%
Total		750		100%

DESCRIPTION OF COURSE GRADES:

Lecture Tests: There will be two announced lecture exams during the semester. A typical exam contains 75 questions but may be in any format including but not limited to: multiple-choice, true/false, matching, etc. Exam dates will be announced at least one week prior to the exam and every effort will be made to schedule those dates at the beginning of the semester so that students can plan their schedules accordingly. All students should avoid personal conflicts on anticipated exam dates. The instructor reserves the right to change exam dates as needed and will give notice of any changes in the exam schedule as soon as it's possible.

Mid-term Exam: A midterm exam will be administered over content covered during the first half of the semester. The mid-term will be composed of 100 total questions: 30 old exam questions (exam 1) and 70 new exam questions over material covered since exam 1. It is in the student's best interest to review the first exam prior to the midterm so they can avoid making the same mistakes twice and to identify areas of weakness. The midterm exam is valued at 20% of the final course grade.

Final Exam: A final exam will be administered over content covered during the second half of the semester (everything since the midterm). The final exam will be composed of 100 total questions: 30 old exam questions (from exam 3) and 70 new test questions over material covered since exam 3. It is in the student's best interest to review exam 3 prior to the final exam so they can avoid making the same mistakes twice and to identify areas of weakness. The final exam is valued at 20% of the final course grade.

Class Participation: Class participation will be determined by each instructor and may be calculated on the basis of one or more of the following methods: pop quizzes, homework, discussions in-class, discussions in D2L, in-class exercises, lecture assignments, projects, or producing a research paper over a selected topic. The class participation quizzes are valued at 100 points. This class will utilize an online lecture quiz system <https://kahoot.it>.

OpenStax/LibGuides Project: Each instructor has identified a small portion of the course content that he/she WILL NOT teach during the formal lecture portion of the class. Instead, students will be assigned a project that utilizes the OpenStax textbook and course LibGuides to introduce students to the content. The OpenStax project also requires students to complete a survey regarding the quality and efficiency of the OpenStax text and LibGuides in the completion of the project. Specific instructions for the project and accompanying survey will be distributed by the instructor at the beginning of the semester via D2L. The OpenStax/LibGuides Project is valued at 100 points in the overall course grade.

Lab Grade Calculation: The laboratory grade constitutes 20% of the overall course grade. The lab grade will be derived as the average of four grades: pre-lab quizzes worth 100 points total, lab exercises worth 100 points total, and 2 lab practicals each worth 100 points. There are a total of 9 lab exercises. You will have a 10 point pre-lab quiz and a 10 point lab exercises for each of the 9 topics. Your highest pre-lab quiz and your highest lab exercise grade will count twice to bring them to a total of 100 for each. Each lab practical will be administered during your normally scheduled lab time. Lab practicals can be in any format including: fill-in-the-blank, multiple-choice, diagrams, discussion, etc.

Lab Grade will be based on the following:	Points Possible	Points Earned
Pre-lab Quizzes	100 points	
Participation and Completion of the Lab Exercises	100 points	
Lab Midterm Exam	100 points	
Lab Final Exam	100 points	
Total	400 points	

GRADE SCALE:

90 - 100% = A 80 - 89% = B 70 - 79% = C 60 - 69% = D < 59% = F

EARLY GRADES:

Georgia Highlands College offers a variety of part-of-term classes to allow our students to have flexible schedules. However, there are only three Semesters each year; Spring, Summer and Fall. It is only at the end of each Semester that grades are rolled to academic history and available on the official transcript. After each part-of-term, as soon as Instructors have entered grades, they may be viewed online by logging into the SCORE (https://discovery.highlands.edu:9986/pls/SCORE/twbkwbis.P_WWWLogin). Transcripts may also be request at any time by logging into the SCORE. Prior to the end of term, should a student need an early grade letter sent to another institution they may complete the request form and submit it to the Registrar's Office for processing (<http://www.highlands.edu/site/registrar-forms>). Please contact the Registrar's Office at registrar@highlands.edu for assistance.

EARLY WARNING PROGRAM:

Georgia Highlands College requires that all faculty members report their students' progress throughout the course of the semester as part of the institution-wide Early Warning Program (EWP). The objective of the program is to support academic success by reviewing early indicators of satisfactory student progress. In accordance with EWP, faculty members will provide the Registrar's Office with academic reports of each student enrolled in their course(s) at check points staggered throughout the semester. The following success factors are reported at their corresponding checkpoint:

Week 2: Notification of Non-Attendance

Week 6: Satisfactory or Unsatisfactory Progress

UNDER GEORGIA LAW, GRADES CANNOT BE DISTRIBUTED BY TELEPHONE OR EMAIL, OR POSTED BY SOCIAL SECURITY NUMBER.

FINANCIAL AID:

This message applies only to students receiving financial aid = "Federal regulations state that if a student did not attend classes and received failing grades, then the grades were not earned and financial aid needs to be reduced accordingly. Please be advised that any student receiving a 0.00 GPA will be required to prove that the 0.00 GPA was earned by attending classes or completing requirements for each class. Students who have earned at least one passing grade for the semester will not be affected by this regulation. If a student has properly withdrawn from all classes, the student's financial aid should be adjusted from the time they signed the withdrawal form".

TOBACCO-FREE CAMPUS:

Georgia Highlands College prohibits the use of tobacco products on any property owned, leased, or controlled by GHC. All faculty, staff, students, visitors, vendors, contractors, and all others are prohibited from using any tobacco products (i.e. cigarettes, eCigarettes, cigars, smokeless tobacco, snuff, chewing tobacco, etc.) while on GHC property.

EXAM POLICIES:

1.	A #2 pencil and scantron are the only item students are allowed to have at their seat during a test and/or exam. All other possessions (coats, purses, textbooks, bookbags, cell phones, food/drinks, etc.) are to be left in the front or side of the room prior to the start of the test.
2.	Exams are typically matching or multiple-choice. Students must provide their own scantron form (Form No. 882-E), which are available at the campus bookstore at a small cost. For this reason and because Scantron forms can become damaged in use, students are encouraged to be prepared with several forms at every test or exam. Scantron forms must be clean and uncreased and must be marked clearly to be read properly. Running out of forms, using forms that are in poor condition or marking forms improperly will lead to a student receiving no credit for the corresponding test or exam. The answers marked on the Scantron form are the ones graded. No credit will be given for answers marked correctly on the examination copy which are marked incorrectly on the Scantron form.
3.	Be sure all cell phones are turned OFF prior to starting a test. If a student's phone rings during a test, the student will be required to turn in their test, leave the room, and not return until the next class meeting. The student will not be allowed to complete the test and the test will be graded "as is".
4.	If a student is late for an exam (15 minutes or more), his/her exam must be handed in with the rest of the class. If any exam has been handed in prior to the student's arrival, the student may not be allowed to take the exam and may receive a zero for that assignment.
5.	Exams are graded by hand or by machine. Lecture tests and lab practicals will not be returned to the student to keep. Students must make an appointment with the instructor to review any or all old test. Students are encouraged to review tests and lab practicals to ensure accuracy of grading.
6.	After an exam has been completed, both the exam and answer sheet is to be signed and handed in. Failure to hand in both the exam and the answer sheet will be considered a violation of the academic integrity code.

7.	If a lecture test is missed for a documented emergency (i.e. hospitalization or death of an immediate family member, jury duty, military deployment, illness verified by a medical note, etc.), a make-up test over the material missed may be administered at the discretion of the instructor and at a time and location that is convenient to the instructor. Students must present documentation of the emergency upon returning to school. Proper documentation includes: doctor's statement, hospital record, court appearance letter, police report of a traffic accident, funeral program, letter from employer, tow truck bill, etc. A letter from a student's guardian does not constitute proper documentation.
8.	Students must contact the professor within 24 hours of the absence to schedule a make-up test. Failure to contact the instructor within 24 hours of the absence will result in a loss of all rights to take a make-up test. All make-up tests must be taken within 2 days of the absence. If the student chooses to leave an email message for the instructor, the student must leave a phone number or email address where they can be contacted. Failure to check email or voicemail does not constitute an excuse for missing a make-up date and will not extend the amount of time to take the makeup.
9.	Due to the nature of the typical lab setting, there will be no make-up opportunities to earn lab points lost due to failure to attend. If a documented emergency (see definition of emergency above) causes you to miss a lab, the student is solely responsible for learning any missed material from your lab-mates. If the emergency causes you to miss a lab practical, contact the instructor within 24 hours of the absence to reschedule the lab practical. If you fail to call or email with 24 hours to schedule a make-up, it cannot be made up!! All make-up lab practicals must be taken during the week of lab practical examination and within 2 days of the absence. Failure to take the lab practical on the week it is administered, forfeits the student's rights to take the lab practical.
10.	Only one make-up test is allowed for the entire course. There will be no "re-takes". Make-up tests can be in any format and may include any or all of the following: essay, multiple-choice, fill in the blank, matching.
11.	Lecture tests and lab practicals will not be returned to the student to keep. Students must make an appointment with the instructor to review any or all old test. Students are encouraged to review tests and lab practicals to ensure accuracy of grading.
12.	No tentative averages will be calculated by the instructor. The instructor provides detailed instructions on how to calculate the course grade in the syllabus (see above). Students are encouraged to use this information to make their own calculations. The instructor will provide an S (satisfactory) or U (unsatisfactory) at mid-term to help you determine if you are making adequate progress in the course to reasonably pass the class.
13.	Grades will be posted via D2L. Due to FERPA the instructor will not disclose grades via phone or email.

GENERAL COURSE ETTIQUETE & POLICIES:

1.	EMAIL: GHC email is the official means of communication used by the college. If a student experiences technical difficulties with their Georgia Highlands College email, they should contact the IT Office immediately. The Cartersville IT Office is located in Room 171a. The instructor is not responsible for technical difficulties that arise with email (especially if the student is using an email account other than the provided Georgia Highlands College email account). Students may opt to have their GHC email forwarded to their personal email account however, the instructor will not respond to emails coming from personal email accounts.
2.	DISRUPTIVE BEHAVIOR: Board of Regents policy: "Any student, faculty member, administrator, or employee, acting individually or in concert with others, who clearly obstructs or disrupts, or attempts to obstruct or disrupt any teaching, research, administrative, disciplinary, or public service activity, or any other activity authorized to be discharged or held on any campus of the University System is considered by the Board to have committed an act of gross irresponsibility and shall be subject to disciplinary procedures, possibly resulting in dismissal or termination of employment" (BR Minutes, 1968-69, pp. 166-168; 1970-71, p. 98) source: USG Manual
3.	TECHNOLOGY: The instructor is not responsible for technical difficulties that arise with D2L. A "Getting Started Tutorial with D2L" is available at: http://www.highlands.edu/d2l . Students can get 24 Hour online Assistance at: https://d2lhelp.view.usg.edu . Students can retrieve their D2L login credentials from the GHC ID Lookup link at: http://www.highlands.edu/site/banner-portal .

4.	ELECTRONICS POLICY: This class will utilize an online lecture quiz system https://kahoot.it . You will need some sort of electronic device with wifi capability (cellphone, laptop, tablet) to be able to access the website. Your device is to be out ONLY when an online quiz question is present in lecture. Please be courteous and mindful of your fellow classmates and instructor while on your device. Unless a Kahoot question is active during lecture, I do NOT want to see any electronic device at any point in lecture or lab. If your device causes you to be a distraction to the class you will need to leave the classroom. Video recording of lecture and/or lab is NOT allowed.
5.	CAMPUS CARRY: For guidance on HB280 Campus Carry, please link to the USG website www.usg.edu/hb280
6.	LAB STATEMENT: Since this course involves a laboratory component, there are specific safety issues that students need to be aware of (such as use of lab coats and/or safety goggles, or any other example specifically related to that course). It is the student's responsibility to be aware of all such issues and act in an extremely cautious manner to avoid any potential causes for accidents in the laboratory. GHC is not liable for any accidents in the lab due to negligence on the part of any individual. Specific safety issues are discussed in the lab manual and laboratory safety lecture. It is also recommended that if you are pregnant or intend on becoming pregnant during the course, that you not take the course at this time.
7.	CHILDREN: Please make other arrangements for your children during lecture and lab times.

WITHDRAWAL POLICY:

Any student withdrawing from Georgia Highlands College following registration must notify the Registrar's Office so that an official withdrawal can be made. This procedure also applies to veterans receiving allowance under any act of Congress and to students receiving financial aid. Students under eighteen years of age are expected to secure the consent of their parents before withdrawing from the College. Withdrawals without penalty will not be permitted past the mid-point of the semester except in cases of hardship as determined by the Vice President for Academic Affairs. Students must complete a student withdrawal request form, available on all campuses, to withdraw officially from all classes. Students with financial aid awards should be aware that fees may be owed if their withdrawal affects their financial aid. The official withdrawal date is indicated by the student's intention the signed and dated form. Student accounts will be refunded according to a graduated percentage scale beginning the second meeting day of classes. Hardship withdrawals and grade appeals must be filed by the end of the academic semester immediately following the academic semester in which the withdrawal or appeal is requested.

If a student decides not to attend the College the semester for which he/she has registered and paid fees, the student may officially withdraw. Students who abandon classes without following proper procedures will receive a grade of F in all classes.

DISABILITY STATEMENT:

"If any student in the class feels that he or she needs accommodation due to a disability, please feel free to discuss this with the instructor early in the term. Georgia Highlands College has resources available for students with certain disabilities. Accommodations may be made (such as providing materials in alternative formats, assuring physical access to classrooms or being sensitive to interaction difficulties that may be posed by communication and/or learning disabilities) through Student Support Services on all campuses. For more information please contact: Cartersville 678-872-8004; Douglasville and Floyd 706-368-7536; Marietta 678-915-5021; Paulding 678-946-1029."

ACADEMIC INTEGRITY:

Cheating is strictly prohibited. Any evidence of cheating, or collaboration in cheating will result in a zero on the assigned materials and possible further disciplinary actions which may include failure in the course. Any appearance of cheating will be regarded as cheating so students should avoid any and all behaviors that could even be construed as cheating. Policies on student conduct and academic integrity are located in the GHC "Student Guide and Planner" and in the Student Handbook at <http://www.highlands.edu/site/academic-integrity-documents>.

TENTATIVE LECTURE SCHEDULE

Semester Year

NOTE: This is a tentative lecture schedule for BIOL 2107K CRN# . The instructor(s) teaching these classes reserves the right to alter this schedule at his/her discretion. Any changes in this schedule will be announced to the students as soon as it is possible.

DATE	DAY	CHAPTER	LECTURE TOPIC	LAB EX	LAB
	T	1	Course Overview/ The Study of Life Drop day	1	Lab Safety Orientation / Introduction to Measurement
	R	2 & 3	The Chemical Foundation of Life/ Biological Macromolecules/ Attendance		
	T	3 & 4	Biological Macromolecules /Cell Structure/ Review	2 & 3	Introduction to Microscopy/ Macromolecules
	R	1-4	Exam 1		
	T	5 & 6	Structure and Function of Plasma Membranes/ Metabolism	4 & 5	Instrumentation & Techniques Enzymes
	R	7 & 8	Cell Respiration/Photosynthesis /S/U		
	T	9	Cell Communication /Review	1-4	Lab Midterm Exam
	R	1-9	Comprehensive Midterm		
	T		Independence Holiday NO CLASS		
	R		Independence Holiday NO CLASS		
	T	10	Cell Reproduction/ Last Withdrawal Day	6 & 7	Cellular Respiration/ Microscopy & Cell Division
	R	11 & 12	Meiosis and Sexual Reproduction/ Mendel's Experiments and Heredity		
	T	13	Modern Understanding of Inheritance/Review	8 & 9	Photosynthesis I/ Mechanisms of Evolution
	R	10 - 13	Exam 3		
	T	14 & 15	DNA Structure and Function/ Genes and Proteins	5-9	Lab Final Exam
	R	16 & 17	Gene Expression/ Biotechnology and Genomics/ Plasmid Due		
	T	18	Evolution/Review Day		
	R	10 - 18	Comprehensive Final Exam @ 11:00 am		

GOOD LUCK! HAVE FUN! And remember, I am here to help you succeed in this course. Please do not hesitate to ask questions if you need assistance.



COURSE INFORMATION:

SEMESTER/YEAR:	
CRN#	
LECTURE DAY/TIME:	
LAB DAY/TIME:	
CREDIT HOURS:	

LECTURE INSTRUCTOR INFORMATION:

NAME:	
TITLE:	
OFFICE PHONE:	
EMAIL:	
OFFICE LOCATION:	
OFFICE HOURS:	

IMPORTANT CLASS DATES:

Drop/Add Period:	
Non-Attendance Reporting:	
S/U Progress Reporting:	
Last day to withdraw with a "W":	
Thanksgiving Break (no classes):	
Last day of Class:	
Course Final Exam:	
Grades Due:	

COURSE DESCRIPTION:

Biology 2108K: Principles of Biology II

(3-3-4) Prerequisite: BIOL 2107K with a grade of C or better. This course will explore the classification and the phylogenetic relationship of prokaryotes, protists, fungi, animals and plants. Included will be discussions on the history of evolutionary thought, speciation, population biology and ecology. Students will also be introduced to comparative vertebrate anatomy and physiology. As with BIOL 2107K, students will be required to research topics outside of the classroom. **Laboratory Fee Required.** [Georgia Highlands Catalog 2017-2018]

STUDENT LEARNING OUTCOMES FOR SCIENCE:

Georgia Highlands College Educational Effectiveness Goal for Science: Students will demonstrate knowledge of the fundamental concepts of at least one scientific discipline, and an understanding of the interplay between theory, experimentation, and observation undergirding those concepts.

Georgia Highlands College Student Learning Outcomes for Science: Students will demonstrate knowledge of the fundamental concepts of at least one scientific discipline, and an understanding of the interplay between theory and experimentation and observations undergirding those concepts.

1.	Students will demonstrate competency of one discipline in the sciences in terms of its informational content.
2.	Students will demonstrate competency of one discipline in the sciences in terms of its terminology.
3.	Students will demonstrate competency of one discipline in the sciences in terms of its commonly used units of measurement.

4.	Students will demonstrate the ability to operate basic instrumentation, gather data, analyze data, and generate conclusions in a laboratory or observational setting.
5.	Students will demonstrate the ability to apply discipline content to problem solving.

COURSE OBJECTIVES AND COMPETENCIES FOR BIOL 2108K:

Upon completion of this course, students should be able to:

1.	Describe the different historical explanations for the origin of life and species, with special emphasis on Darwinian evolution (including natural selection, mechanisms of genetic change in populations, and speciation).
2.	Identify and characterize the biological kingdoms and their component taxa (phyla, subphyla, divisions, and classes); the student will also be able to describe the major evolutionary advances that characterize these taxa.
3.	Describe selected growth, reproductive, and physiological processes for representative groups of organisms.
4.	Define/identify/utilize terminology specific to biology.
5.	Follow dissection and observational procedures, make observations, and identify organisms, and structures and their functions from both live and preserved specimens.
6.	Identify, research, and describe current biological research published in peer-reviewed biology publications and sources.

REQUIRED TEXT:

Lecture: OpenStax College. Biology 2e. 2018. Rice University. ISBN: 978-1-947172-51-7 (2nd edition) Download for FREE at: <https://openstax.org/details/books/biology-2e>

Lab: “In house” lab manual will be posted to D2L. Each student will need to print off their weekly lab assignment before class and bring materials to take notes.

Although the instructor provides detailed lecture notes, they are meant only to be a supplement to the above required text. Regularly reading your textbook is HIGHLY encouraged as exam questions are taken from the material in the textbook!!

Helpful links to for students will be on D2L in a folder entitled Extra Help. If students need additional help please see the [GHC 's tutorial center website](#) for a vast array of helpful services and links.

LibGuide:

<https://getlibraryhelp.highlands.edu/c.php?g=793681&p=5676401&preview=0dbb9f28bd154071d02d19e39802b88b>

TECHNICAL HELP:

If you have trouble accessing the course or any other technical issues associated with **Georgia View D2L** then please click on the following link and contact Vista technical help: <https://d2lhelp.view.usg.edu/>

If you have trouble and need to contact a **specific department at GHC** (e.g. eLearning), then you can click on <http://www.highlands.edu/site/ghc411>

ATTENDANCE POLICY:

Lecture: In any science course, there is a direct correlation between class participation and academic performance. Attendance will be recorded for advisory purposes and administrative record keeping. You will be given an individual page to sign each date you attend. Attendance will be monitored and can influence your grade. Any student missing more than 60% of scheduled class meetings (lecture and lab) will be awarded an F\$ for the semester [This symbol is for an unearned F, which indicates that the student stopped attending class and did not fill out appropriate paperwork to withdraw. This grade is computed in the grade point average as an F. A possible implication of an F\$ grade is repayment of any student financial aid money awarded.] Students must routinely log into D2L, check their highlands email daily, and course news announcements daily. It is the student’s sole responsibility for obtaining all materials or announcements that were missed as a result of an absence.

Lab: Weekly attendance to the laboratory is required. Failure to attend laboratory during your normally scheduled lab time will result in the loss of all points associated with that particular lab. Due to the nature of the typical lab setting, there will be no make-up opportunities to earn lab points lost due to failure to attend!!

EXTENDED ABSENCE POLICY:

Students, who have circumstances that prevent them from continuing to attend classes over an extended period of time, sometimes request that the faculty member permit them to submit work in absentia to receive credit to complete the course. If the concurrent absences will constitute more than 15% of the class sessions for the term, then written permission from the Division Chair is required before any course assignments can be completed while missing class. The student must be in good academic standing in the course to make the request. All approved coursework must be completed by the end of the semester in which the course was begun. (Note: If a program has a more stringent absence policy than this, then the program policy prevails.)

INCLEMENT WEATHER POLICY:

In the event of weather related cancellation of classes, the schedule will pick up the sequence of lectures herein described as classes resume. The semester may then be extended, or double lectures designed as we go. If we have covered all material for a test, the test will be given on the first day back to class. If there is inclement weather, the college posts necessary announcements on www.highlands.edu.

The fastest form of notification is sent via GHC NOTIFY alert system. GHC NOTIFY will send you an email/text/automated phone call regarding the closing, delay or emergency. GHC Students are automatically signed up to receive these notices based on the contact information they provided. Students can update their Banner contact information through SCORE if needed. Policies for distance-learning courses relative to inclement weather are different. It is assumed that all distance-learning courses are considered accessible even during periods of inclement weather.

EVALUATION METHODS and GRADING:

GRADE ITEM	POINTS EARNED	POINTS POSSIBLE	SCORE	% OF COURSE GRADE
Lecture exam 1		75		10%
Comprehensive midterm exam		100		20%
Lecture exam 3		75		10%
Comprehensive final exam		100		20%
Scavenger Hunt project valued at 100 points total		100		10%
OER/LibGuide paper valued at 100 points total		100		10%
Laboratory grade valued at 200 points		200		20%
Total		750		100%

DESCRIPTION OF COURSE GRADES:

Lecture Tests: There will be two announced lecture exams during the semester. Each test will be valued at 100 points. A typical exam contains 75 questions but may be in any format including but not limited to: multiple-choice, true/false, matching, etc. Exam dates will be announced at least one week prior to the exam and every effort will be made to schedule those dates at the beginning of the semester so that students can plan their schedules accordingly. All students should avoid personal conflicts on anticipated exam dates. The instructor reserves the right to change exam dates as needed and will give notice of any changes in the exam schedule as soon as it's possible.

Mid-term Exam: A midterm exam will be administered over content covered during the first half of the semester. The mid-term will be composed of 100 total questions: 30 old exam questions (exam 1) and 70 new exam questions over material covered since exam 1. It is in the student's best interest to review the first exam prior to the midterm so they can avoid making the same mistakes twice and to identify areas of weakness. The midterm exam is valued at 20% of the final course grade.

Final Exam: A final exam will be administered over content covered during the second half of the semester (everything since the midterm). The final exam will be composed of 100 total questions: 30 old exam questions (from exam 3) and 70 new test questions over material covered since exam 3. It is in the student's best interest to review exam 3 prior to

the final exam so they can avoid making the same mistakes twice and to identify areas of weakness. The final exam is valued at 20% of the final course grade.

Scavenger Hunt: Students will work in small groups (2 – 3) and be required to collect photographs of specimens from an instructor provided list, each with its own point value. More details about the format and source requirements in D2L. The scavenger hunt is valued at 100 points.

OpenStax/LibGuides Project: Each instructor has identified a small portion of the course content that he/she WILL NOT teach during the formal lecture portion of the class. Instead, students will be assigned a project that utilizes the OpenStax textbook and course LibGuides to introduce students to the content. The OpenStax project also requires students to complete a survey regarding the quality and efficiency of the OpenStax text and LibGuides in the completion of the project. Specific instructions for the project and accompanying survey will be distributed by the instructor at the beginning of the semester via D2L. The OpenStax/LibGuides Project is valued at 100 points in the overall course grade.

Lab Grade Calculation: The laboratory grade constitutes 20% of the overall course grade. The lab grade is based on active participation in lab exercises and lab reports.

Lab Grade will be based on the following:	Points Possible	Points Earned
Statistics Exercise	10	
Fish Lab Assignment	15	
Phylogenetics Exercise	25	
Physiology Lab Report	25	
Ecology Lab Report	50	
Fetal Pig Anatomy Practical Exam	50	
Total	175 points	

Lab Grade Scale:

157-175 = A 140-156 = B 122-139 = C 105-121 = D 0-104 = F

COURSE GRADE SCALE:

90 - 100% = A 80 - 89% = B 70 - 79% = C 60 - 69% = D < 59% = F

EARLY GRADES:

Georgia Highlands College offers a variety of part-of-term classes to allow our students to have flexible schedules. However, there are only three Semesters each year; Spring, Summer and Fall. It is only at the end of each Semester that grades are rolled to academic history and available on the official transcript. After each part-of-term, as soon as Instructors have entered grades, they may be viewed online by logging into the SCORE (https://discovery.highlands.edu:9986/pls/SCORE/twbkwbis.P_WWWLogin). Transcripts may also be request at any time by logging into the SCORE. Prior to the end of term, should a student need an early grade letter sent to another institution they may complete the request form and submit it to the Registrar's Office for processing (<http://www.highlands.edu/site/registrar-forms>). Please contact the Registrar's Office at registrar@highlands.edu for assistance.

EARLY WARNING PROGRAM:

Georgia Highlands College requires that all faculty members report their students' progress throughout the course of the semester as part of the institution-wide Early Warning Program (EWP). The objective of the program is to support academic success by reviewing early indicators of satisfactory student progress. In accordance with EWP, faculty members will provide the Registrar's Office with academic reports of each student enrolled in their course(s) at check points staggered throughout the semester. The following success factors are reported at their corresponding checkpoint:

Week 2: Notification of Non-Attendance

Week 6: Satisfactory or Unsatisfactory Progress

UNDER GEORGIA LAW, GRADES CANNOT BE DISTRIBUTED BY TELEPHONE OR EMAIL, OR POSTED BY SOCIAL SECURITY NUMBER.

FINANCIAL AID:

This message applies only to students receiving financial aid = "Federal regulations state that if a student did not attend classes and received failing grades, then the grades were not earned and financial aid needs to be reduced accordingly. Please be advised that any student receiving a 0.00 GPA will be required to prove that the 0.00 GPA was earned by attending classes or completing requirements for each class. Students who have earned at least one passing grade for the semester will not be affected by this regulation. If a student has properly withdrawn from all classes, the student's financial aid should be adjusted from the time they signed the withdrawal form".

TOBACCO-FREE CAMPUS:

Georgia Highlands College prohibits the use of tobacco products on any property owned, leased, or controlled by GHC. All faculty, staff, students, visitors, vendors, contractors, and all others are prohibited from using any tobacco products (i.e. cigarettes, eCigarettes, cigars, smokeless tobacco, snuff, chewing tobacco, etc.) while on GHC property.

EXAM POLICIES:

1.	A #2 pencil and scantron are the only items students are allowed to have at their seat during an exam and/or lab practical. All other possessions (coats, purses, textbooks, bookbags, cell phones, food/drinks, etc.) are to be left in the front or side of the room prior to the start of the test.
2.	Exams are typically matching or multiple-choice. Students must provide their own Scantron Grading Form (Form No. 882-E), which are available at the campus bookstore at a small cost. Scantron forms must be clean and without creases and must be marked clearly to be read properly. Running out of forms, using forms that are in poor condition or marking forms improperly will lead to a student receiving no credit for the corresponding test or exam. The answers marked on the Scantron form are the ones graded. No credit will be given for answers marked correctly on the exam copy which are marked incorrectly on the Scantron form.
3.	Be sure all cell phones are turned OFF prior to starting a test. If a student's phone rings or vibrates during a test, the student will be required to turn in their test, leave the room, and not return until the next class meeting. The student will not be allowed to complete the test and the test will be graded "as is".
4.	If a student is late for an exam (15 minutes or more), his/her exam must be handed in with the rest of the class. If any exam has been handed in prior to the student's arrival, the student may not be allowed to take the exam and may receive a zero for that assignment.
5.	Exams are graded by hand or by machine. Lecture tests and lab practicals will not be returned to the student to keep. Students must make an appointment with the instructor to review any or all old test. Students are encouraged to review tests and lab practicals to ensure accuracy of grading and questions from the old exams will be used to design new questions for the comprehensive final exam.
6.	After an exam has been completed, both the exam and answer sheet is to be signed and handed in. Failure to hand in both the exam and the answer sheet will be considered a violation of the academic integrity code.
7.	If a lecture test is missed for a documented emergency (i.e. hospitalization, the death of an immediate family member, military deployment, etc.), a make-up test over the material missed may be administered at the discretion of the instructor and at a time and location that is convenient to the instructor. Students must present documentation of the emergency upon returning to school. Proper documentation includes: doctor's statement, hospital record, court appearance letter, police report of a traffic accident, funeral program, letter from employer, tow truck bill, etc. A letter from a student's guardian does not constitute proper documentation.
8.	Students must contact the professor within 24 hours of the absence to schedule a make-up test. All make-up tests must be taken within 2 days of the absence. Failure to contact the instructor within 24 hours of the absence will result in a loss of all rights to take a make-up test. If you choose to leave a voicemail or email message for the instructor, you must leave a phone number or email address where you can be

	contacted. Failure to check your email or voicemail does not constitute an excuse for missing a make-up date and will not extend the amount of time to take the makeup.
9.	Due to the nature of the typical lab setting, there will be no make-up opportunities to earn lab points lost due to failure to attend. If a documented emergency (see definition of emergency above) causes you to miss a lab, the student is solely responsible for learning any missed material from your lab-mates. If the emergency causes you to miss a lab practical, contact the instructor within 24 hours of the absence to reschedule the lab practical. If you fail to call or email with 24 hours to schedule a make-up, it cannot be made up!! All make-up lab practicals must be taken during the week of lab practical examination and within 2 days of the absence. Failure to take the lab practical on the week it is administered, forfeits the student's rights to take the lab practical.
10.	Only one make-up test is allowed for the entire course! There will be no "re-takes". Make-up tests can be in any format and may include any or all of the following: essay, multiple-choice, fill in the blank, matching.
11.	No tentative averages will be calculated by the instructor. The instructor provides detailed instructions on how to calculate the course grade in the syllabus (see above). Students are encouraged to use this information to make their own calculations. The instructor will provide an S (satisfactory) or U (unsatisfactory) prior to mid-term to help you determine if you are making adequate progress in the course to reasonably pass the class.
12.	Grades will be posted via D2L. The instructor will not disclose grades via phone or email due to FERPA.
13.	Although the instructor does not discourage questions during lecture, all questions must be limited to the topic at hand. Furthermore, questions pertaining to the diagnosis of medical conditions based on a list of symptoms that you present in class are not appropriate. The instructor is not a physician and is therefore not licensed to diagnose the medical conditions of students or the family and friends of students. Such questions or concerns should be discussed with your doctor or other healthcare professional! At no time should a student misconstrue the opinions of the instructor as medical advice.

GENERAL COURSE ETTIQUETE & POLICIES:

1.	EMAIL: Your GHC email is the official means of communication used by the college. If a student experiences technical difficulties with their Georgia Highlands College email, they should contact the IT Office immediately. The Marietta IT Office is located in Norton Hall. The instructor is not responsible for technical difficulties that arise with email (especially if the student is using an email account other than the provided Georgia Highlands College email account). You may opt to have your GHC email forwarded to your personal email account however, the instructor will not respond to emails coming from personal email accounts.
2.	DISRUPTIVE BEHAVIOR: Board of Regents policy regarding DISRUPTIVE BEHAVIOR - "Any student, faculty member, administrator, or employee, acting individually or in concert with others, who clearly obstructs or disrupts, or attempts to obstruct or disrupt any teaching, research, administrative, disciplinary, or public service activity, or any other activity authorized to be discharged or held on any campus of the University System is considered by the Board to have committed an act of gross irresponsibility and shall be subject to disciplinary procedures, possibly resulting in dismissal or termination of employment" (BR Minutes, 1968-69, pp. 166-168; 1970-71, p. 98) source: USG Manual
3.	TECHNOLOGY: The instructor is not responsible for technical difficulties that arise with Desire2Learn. If a student experiences technical difficulties with D2L, they should contact the IT Office immediately. A "Getting Started Tutorial with D2L" is available at: http://www.highlands.edu/d2l . Students can also go to the Online 24 Hour Support Center at https://d2lhelp.view.usg.edu . Students can also retrieve their D2L login credentials from the GHC ID Lookup link at: http://www.highlands.edu/site/banner-portal
4.	ELECTRONICS POLICY: Turn off all electronics BEFORE class begins. I do not mind the use of voice tape recorders unless they become a distraction however, the use of computers, cellphones, laptops, i-pads, e-cigarettes, or other electronic devices is NOT allowed. Please be courteous and mindful of your fellow classmates. Video recording of lecture and/or lab is NOT allowed.
5.	CAMPUS CARRY: For guidance on HB280 Campus Carry, please link to the USG website www.usg.edu/hb280
6.	LAB STATEMENT: Since this course involves a laboratory component, there are specific safety issues that students need to be aware of (such as use of lab coats and/or safety goggles, or any other example specifically

	related to that course). It is the student's responsibility to be aware of all such issues and act in an extremely cautious manner to avoid any potential causes for accidents in the laboratory. GHC is not liable for any accidents in the lab due to negligence on the part of any individual. Specific safety issues are discussed in the lab manual and laboratory safety lecture. It is also recommended that if you are pregnant or intend on becoming pregnant during the course, that you not take the course at this time.
7.	CHILDREN: Make other arrangements for your children during class and lab times.

WITHDRAWAL POLICY:

Any student withdrawing from Georgia Highlands College following registration must notify the Registrar's Office so that an official withdrawal can be made. This procedure also applies to veterans receiving allowance under any act of Congress and to students receiving financial aid. Students under eighteen years of age are expected to secure the consent of their parents before withdrawing from the College. Withdrawals without penalty will not be permitted past the mid-point of the semester except in cases of hardship as determined by the Vice President for Academic Affairs. Students must complete a student withdrawal request form, available on all campuses, to withdraw officially from all classes. Students with financial aid awards should be aware that fees may be owed if their withdrawal affects their financial aid. The official withdrawal date is indicated by the student's intention the signed and dated form. Student accounts will be refunded according to a graduated percentage scale beginning the second meeting day of classes. Hardship withdrawals and grade appeals must be filed by the end of the academic semester immediately following the academic semester in which the withdrawal or appeal is requested.

If a student decides not to attend the College the semester for which he/she has registered and paid fees, the student may officially withdraw. Students who abandon classes without following proper procedures will receive a grade of F in all classes.

DISABILITY STATEMENT:

"If any student in the class feels that he or she needs accommodation due to a disability, please feel free to discuss this with the instructor early in the term. Georgia Highlands College has resources available for students with certain disabilities. Accommodations may be made (such as providing materials in alternative formats, assuring physical access to classrooms or being sensitive to interaction difficulties that may be posed by communication and/or learning disabilities) through Student Support Services on all campuses. For more information please contact: Cartersville 678-872-8004; Douglasville and Floyd 706-368-7536; Marietta 678-915-5021; Paulding 678-946-1029."

ACADEMIC INTEGRITY

Cheating is strictly prohibited. Any evidence of cheating, or collaboration in cheating will result in a zero on the assigned materials and possible further disciplinary actions which may include failure in the course. Any appearance of cheating will be regarded as cheating so students should avoid any and all behaviors that could even be construed as cheating. Policies on student conduct and academic integrity are located in the GHC "Student Guide and Planner" and in the Student Handbook at <http://www.highlands.edu/site/academic-integrity-documents>.

TENTATIVE LECTURE SCHEDULE

Semester Year

NOTE: This is a tentative lecture schedule for BIOL 2108K CRN#. The instructor(s) teaching these classes reserves the right to alter this schedule at his/her discretion. Any changes in this schedule will be announced to the students as soon as it is possible.

DATE	DAY	LECTURE TOPIC	CHAPTER	LAB
	T	Course Overview/ Last Day to Drop Class 8/22		No lab
	R	Viruses	21	
	T	Prokaryotes: Bacteria and Archaea	22	Introduction / Safety / Science Writing & Statistics I
	R	Prokaryotes: Bacteria and Archaea/ Attendance 8/30	22	
	T	Protists	23	Science Writing & Statistics II (Fish Lab)
	R	Fungi	24	
	T	Fungi /Review	24	Phylogenetics Lab I
	R	Exam 1	21-24	
	T	Seedless Plants	25	No Labs (writing time for Phylogenetics Report)
	R	Seed Plants	26	
	T	Plant Form and Physiology	30	Physiology Lab
	R	Soil and Plant Nutrition S/U Progress Report 10/1	31	
	T	Plant Reproduction	32	No Labs (writing time for Physiology Report)
	R	Plant Reproduction/Review	32	
	T	Comprehensive Midterm	21-26, 30-32	Ecology Lab
	R	Introduction to Animal Diversity	27	
	T	Invertebrates/ Scavenger Due	28	Reserve Week (If needed for weather)
	R	Vertebrates / Last Day to Withdraw 10/22	29	
	T	Vertebrates	29	Pig Dissection I
	R	Animal Body: Form and Function	33	
	T	Animal Body: Form and Function	33	Pig Dissection II
	R	Animal Nutrition and Digestive System	34	
	T	Animal Nutrition and Digestive System/Review	34	Pig Practical Exam
	R	Exam 3	27-29, 33, 34	
	T	Animal Reproduction and Development	43	
	R	Animal Reproduction and Development	43	
	T	Thanksgiving Break NO CLASS		
	R	Thanksgiving Break NO CLASS		
	T	Ecology and Biosphere	44	
	R	Population and Community Ecology/ Research Paper Due	45	
	T	Ecosystems	46	
	R	Conservation and Biodiversity / Review Day	47	
	R	Comprehensive Final Exam @ 3:30pm	27-29, 33, 34, 43-47	

GOOD LUCK! HAVE FUN! And remember, I am here to help you succeed in this course. Please do not hesitate to ask questions if you need assistance.



Final Report

BIOL 2107/2108 Principles of Biology
ALG Grant #370, Round 11

General Information

Date: 12/21/18

Grant Round: 11

Grant Number: 370

Institution Name(s): Georgia Highlands College

Project Lead: Kimberly Subacz

Team Members (Name, Title, Department, Institutions if different, and email address for each):

- Jacqueline Belwood, Associate Professor of Biology, Division of Natural Science and Physical Education, Georgia Highlands College, jbelwood@highlands.edu
- Karin Bennedsen, Assistant Librarian of Public Services, Paulding Instructional Site, Georgia Highlands College, kbernde@highlands.edu
- Lisa Branson, Associate Professor of Biology, Division of Natural Science and Physical Education, Georgia Highlands College, lbranson@highlands.edu
- Thomas Harnden, Professor of Biology, Division of Natural Science and Physical Education, Georgia Highlands College, tharnden@highlands.edu
- Sharryse Henderson, Professor of Biology, Division of Natural Science and Physical Education, Georgia Highlands College, shenders@highlands.edu
- Mark Knauss, Professor of Biology, Division of Natural Science and Physical Education, Georgia Highlands College, mknauss@highlands.edu
- Kimberly Subacz, Instructor of Biology, Division of Natural Science and Physical Education, Georgia Highlands College, ksubacz@highlands.edu

Course Name(s) and Course Numbers: BIOL 2107K – Principles of Biology I and BIOL 2108K – Principles of Biology II.

Semester Project Began: Spring 2018

Final Semester of Implementation: Fall 2018

Total Number of Students Affected During Project: 418

1. Narrative

A. Key Outcomes:

The purpose of this project was to engage in a department-wide effort to transform two of our gateway courses, Principles of Biology I (BIOL 2107K) and Principles of Biology II (BIOL 2108K), by adopting an appropriate Open Educational Resource and by developing accompanying ancillary materials (chapter outlines/summaries, PowerPoints, and chapter checklists) as well as creating supplemental imagery for insertion into the PowerPoints. In

addition, all materials created were designed to meet the internationally recognized Quality Matters (QM) standards.

Our project goals are to:

- Identify and adopt an appropriate Open Educational Resource (OER) to best compliment student-learning outcomes for BIOL 2107K and BIOL 2108K. Preference will be given to OpenStax *Biology 2e* for the lecture component of the course.
- Redesign current ancillary materials for BIOL 2107K and BIOL 2108K using the OER framework (images, tables, etc.). When needed, purchase copyright-free images from on-line sources and/or create new images using one or more graphic designers from among GHC students, faculty, or staff.
- Create supplemental course materials to support instruction with the new OER. Supplemental course materials will include chapter summaries, detailed instructional PowerPoints, and chapter checklists.
- Create a complementary LibGuides for both BIOL 2107K and BIOL 2108K. Each LibGuides will serve as a repository for any instructional materials created as part of this grant but also house links to videos, animations, tutorials and other ancillary materials that faculty currently use in the instruction of their courses.
- Improve student success in BIOL 2107K and BIOL 2108K and reduce drop/fail/withdraw (DFW) rates in courses that currently have among the highest DFW rates at GHC.
- Increase retention, progression, and graduation (RPG) rates of STEM students at Georgia Highlands College.
- Survey students enrolled in the redesigned courses and faculty who teach them to assess adopted OERs with regard to 1) convenience and ease-of-use, 2) effectiveness and quality, and 3) attainment of student-learning outcomes.

In accomplishing these goals, we experienced a few challenges. For example, the team attempted to design a common course syllabus to ensure that all student learning outcomes were being addressed in course content and to ensure each faculty member was evaluating their students in a similar manner. The common course syllabus was not well-received by some of our more senior faculty as it meant they would have to make changes in the way they were previously teaching their classes. Those in opposition were particularly concerned about the proposed grading system. We have attached a sample of the common syllabus.

Fortunately for every challenge we faced, there were many more rewards. This project encouraged dialogue among faculty across campuses and encouraged collaboration where previously there was none. Furthermore, will improve the transition of new full-time and part-time faculty into our teaching ranks. Because all of the ancillary materials are made readily available on a master course, new faculty will not have to create their classes from scratch or have to beg and borrow from colleagues. They were able to merely adopt the newly created ancillary materials and modify them for their particular teaching style. Furthermore, the use of a common syllabus and common chapter outlines ensured that those faculty less experienced with teaching at GHC could be confident they were covering the minimum content not only expected of them but also necessary to achieve common student learning outcomes.

Because the textbook was free and easily viewed on a variety of electronic devices, students were able to access the textbook anytime and anywhere. We found that some students were more prepared, as they had read the textbook chapter and/or summarized lecture notes before

class. Unfortunately, our survey suggests that a large chunk of students are still not reading their textbook as we would hope. Of the BIOL 2107K and BIOL 2108K students surveyed, 46.2% of them reported they rarely or never used the textbook. On a more positive note however, the survey suggests students are utilizing the ancillary materials. Nearly 90.3% of surveyed students reported using the chapter summaries occasionally, regularly, or always. The PowerPoints and chapter checklists had similar high usage ratings (99% and 82.5% respectively). Furthermore, of the students surveyed, nearly 82.1% of BIOL 2107K and BIOL 2108K students were satisfied with the ancillary materials we created, with 52.4% of those indicating they were “Very satisfied”.

To determine if there was a positive impact on student performance, we compared the DFWI rates in three semesters prior to the grant cycle (pre-transformation: spring 2017, summer 2017, and fall 2017) to the three semesters during the grant cycle (post-transformation: spring 2018, summer 2018, and fall 2018). Although we did not see a positive impact on the grade distributions during the pre- versus post-transformation semesters, the overall DFWI rates in both BIOL 2107K and BIOL 2108K was essentially unchanged suggesting student performance was not negatively impacted by switching from the high-cost proprietary textbooks to the free and open sourced textbooks (Figure 1).

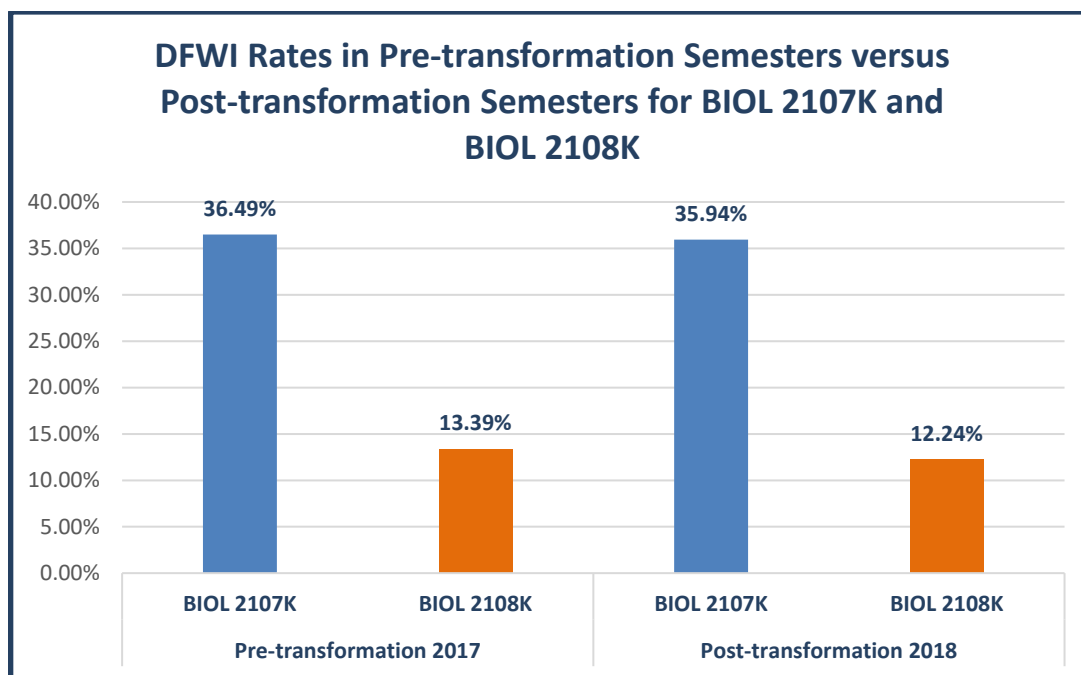


FIGURE 1. DFWI rates in pre-transformation semesters versus post-transformation semesters.

B. Describe lessons learned, including any things you would do differently next time.

While the students appreciated not having to incur the expense of a traditional publisher’s textbook, fewer students utilized the OpenStax *Biology 2e*. textbook than we wanted. It appears some students are not inclined to use the book at all. We developed chapter checklist exercises to encourage students to utilize their textbook more often. It appears that students are electing to use the ancillary materials we created more often than the textbook. Many students even commented they wanted additional materials including lecture videos,

laboratory videos, active-learning homework, and more (Figure 2). For future projects, we plan to develop some of these additional resources.

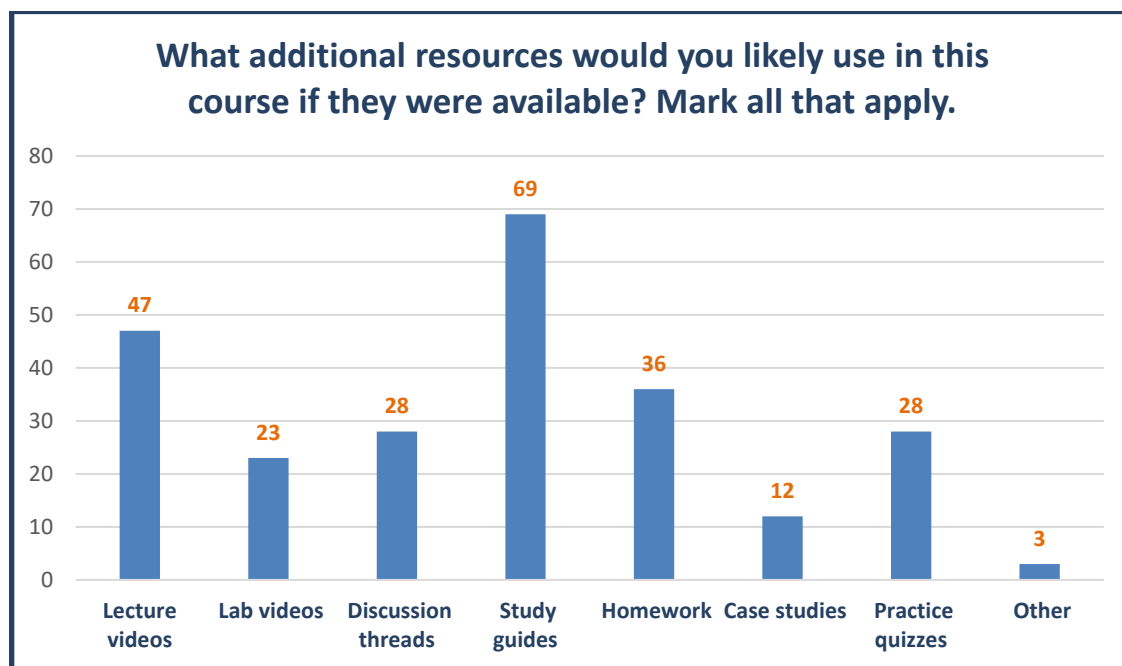


FIGURE 2. Additional ancillary resources requested by surveyed students.

One of the greatest challenges we encountered during the implementation of our goals was the creation of supplemental images and purchase of Shutterstock images to support the production of complimentary PowerPoints to the OpenStax *Biology 2e*. We first set out to hire GHC student workers to create unique imagery using graphic design software. This would give our students a chance to showcase their artistic skills and be a useful addition to our ancillary OER materials. After the first 6 months, we discovered the two students did not have adequate time to dedicate to this project. Creating imagery restricted their time dedicating to studying, and therefore was not successful. It was determined that this portion of the project should be abandoned.

The team also attempted to utilize Shutterstock images as a resource but was unsure if purchased images could then be utilized under the Creative Commons license for the public to access and use. We ultimately were unable to produce any additional images to supplement the original OER PowerPoints. As a result, all funds dedicated to the production of images has gone unused.

In the future, our team would suggest hiring a professional graphic artist to create additional unique imagery. Any additional images found in the PowerPoints can be credited to their source.

2. Quotes

"I think having low or free textbooks like OpenStax Biology is a great idea. This would ease the burden of many students worrying about the cost of books. I see no difference in these books versus traditional course textbooks."

"I think having a low or free textbook like OpenStax Biology gives student more access to the material of the course because many students aren't able to afford traditional course textbooks which puts them at a disadvantage."

"College alone is expensive. Textbooks are a costly addition that can make it even harder for students to afford. I have many friends who do not purchase their recommended textbooks, due to costs. Having a free or low cost book gives every student a fair chance at excelling in their courses."

3. Quantitative and Qualitative Measures

3a. Uniform Measurements Questions

The following are uniform questions asked to all grant teams. Please answer these to the best of your knowledge.

Student Opinion of Materials

Was the overall student opinion about the materials used in the course positive, neutral, or negative?

Total number of students affected in this project: 418

- Positive: 73.2 % of 106 number of respondents
- Neutral: 21.9 % of 106 number of respondents
- Negative: 4.9 % of 106 number of respondents

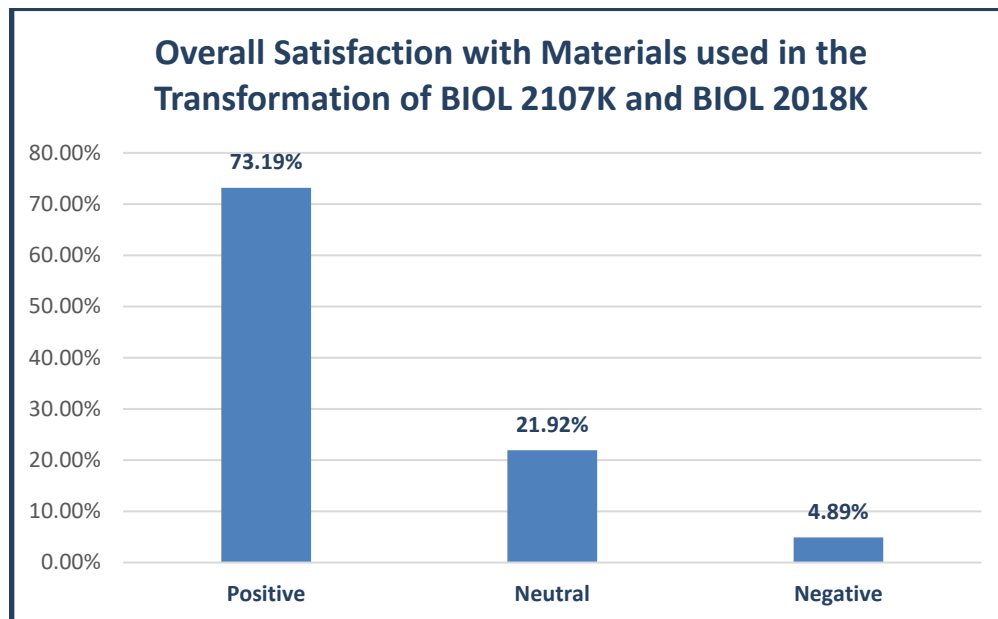


Figure 3. Overall Satisfaction with textbook and ancillary materials used during the transformation of BIOL 2107K and BIOL 2108K.

Student Learning Outcomes and Grades

Was the overall comparative impact on student performance in terms of learning outcomes and grades in the semester(s) of implementation over previous semesters positive, neutral, or negative?

Choose One:

- Positive: Higher performance outcomes measured over previous semester(s)
- Neutral: Same performance outcomes over previous semester(s)
- Negative: Lower performance outcomes over previous semester(s)

Student Drop/Fail/Withdraw (DFW) Rates

Was the overall comparative impact on Drop/Fail/Withdraw (DFW) rates in the semester(s) of implementation over previous semesters positive, neutral, or negative?

Drop/Fail/Withdraw Rate:

Depending on what you and your institution can measure, this may also be known as a drop/failure rate or a withdraw/failure rate.

36.97% % of students, out of a total 165 students affected, dropped/failed/withdrew from the course in the final semester of implementation.

Choose One:

- Positive: This is a lower percentage of students with D/F/W than previous semester(s)
- Neutral: This is the same percentage of students with D/F/W than previous semester(s)
- Negative: This is a higher percentage of students with D/F/W than previous semester(s).

3b. Measures Narrative

Surveys distributed to students in BIOL 2107K and BIOL 2108K contained a combination of multiple-choice and open-ended questions about the OpenStax *Anatomy and Physiology* textbook and the newly created ancillary materials. In regard to the text, four themes emerged: (1) the free text was comparable to using a proprietary text, (2) the text was easy to access and navigate, (3) students preferred to have choices regarding the format in which they access the text (print vs. online) and (4) fewer students were utilizing the textbook than expected. Overall, the open-ended questions support the notion of continued use of free or low-cost resources in both courses. In regard to the ancillary materials, three themes emerged: (1) the resources created for each chapter provided helpful alternative explanations to concepts covered, (2) chapter summaries and PowerPoints were accessed the most, and (3) additional resources should be created. In conclusion, there is sufficient evidence to support the continued use of OERs and the creation of additional ancillary materials. The student survey data is summarized in Table 1 below:

Question	Responses reported	Percentage
When registering for college courses, I am concerned about the cost of the textbook and other course materials.	Agree or Strongly agree	52.8%
How frequently did you use the OpenStax <i>Anatomy and Physiology</i> textbook?	Occasionally, Regularly, or Always	53.8%
In comparison to traditional college textbooks, the overall quality of the OpenStax <i>Anatomy and Physiology</i> textbook is adequate for my needs.	Agree or Strongly agree	56.9%
Reading the OpenStax <i>Anatomy and Physiology</i> textbook was _____ compared to publisher textbooks.	Very easy, Easy, or Average	87.3%
Rate your level of satisfaction with the OpenStax <i>Anatomy and Physiology</i> textbook embedded resources.	Very satisfied or satisfied	62.7%
How often did you use the instructor-provided chapter summaries?	Occasionally, Regularly, or Always	90.3%
Rate your level of satisfaction with the instructor-provided chapter summaries.	Very satisfied or satisfied	83.3%
How often did you use the instructor-provided PowerPoints?	Occasionally, Regularly, or Always	99.1%
Rate your level of satisfaction with the instructor-provided PowerPoints.	Very satisfied or satisfied	93.8%
How often did you use the instructor-provided chapter checklists?	Occasionally, Regularly, or Always	82.5%
Rate your level of satisfaction with the instructor-provided chapter checklists.	Very satisfied or satisfied	69.2%

Table 1: Summary of student survey data randomly administered to students enrolled in BIOL 2107K and BIOL 2108K in fall 2018.

In an attempt to determine the impact of using open source materials on the attainment of Student Learning Outcomes (SLO), assessment data from the three semesters prior to transformation (spring 2017, summer 2017, and fall 2017) were compared against the assessment data collected during the three semesters during the grant cycle (spring 2018, summer 2018, and fall 2018). Only two embedded questions were the same for all six semester and were able to provide reliable result. Embedded assessment question #1 evaluated SLO #5 – Students will demonstrate the ability to apply discipline content to problem solving) while Embedded assessment question #2 evaluated SLO #2 – Students will demonstrate competency of one discipline in the sciences in terms of its terminology. Analysis of the assessment data for these two questions revealed that the percent of students answering the assessment questions correctly was essentially unchanged in the pre-transformation semesters versus those during the grant cycle (Figure 4 and Figure 5). Therefore, the use of OERs and their accompanying ancillary materials had a neutral impact on attainment of Student Learning Outcomes in BIOL 2107K and BIOL 2108K

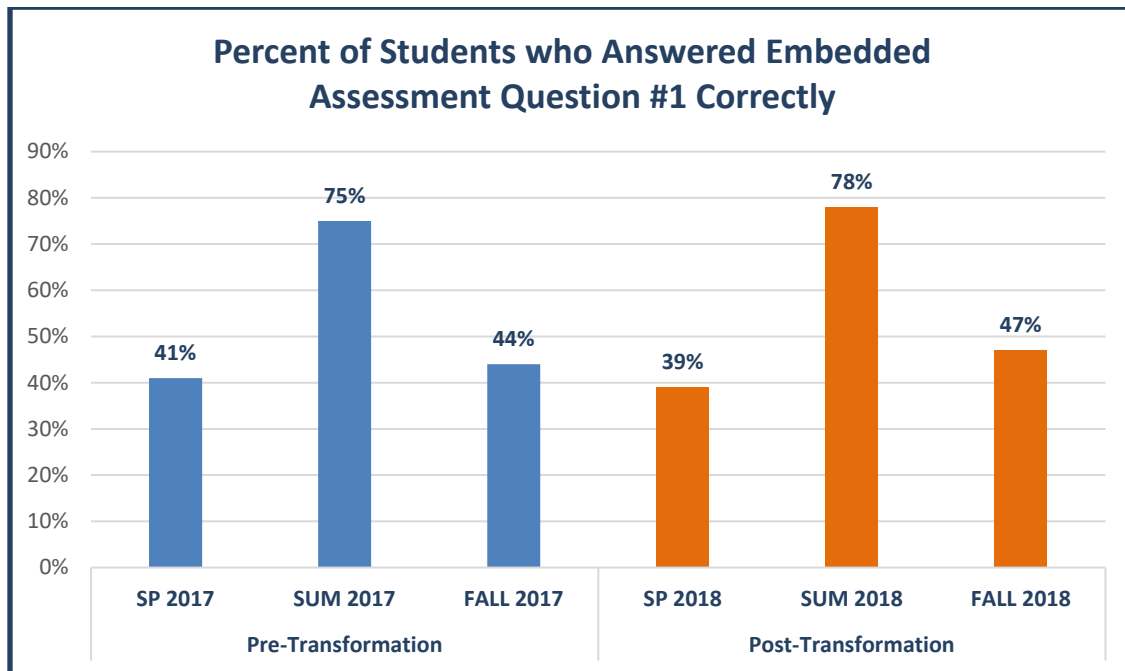


FIGURE 4. Percent of students who answered embedded assessment question #1 correctly.

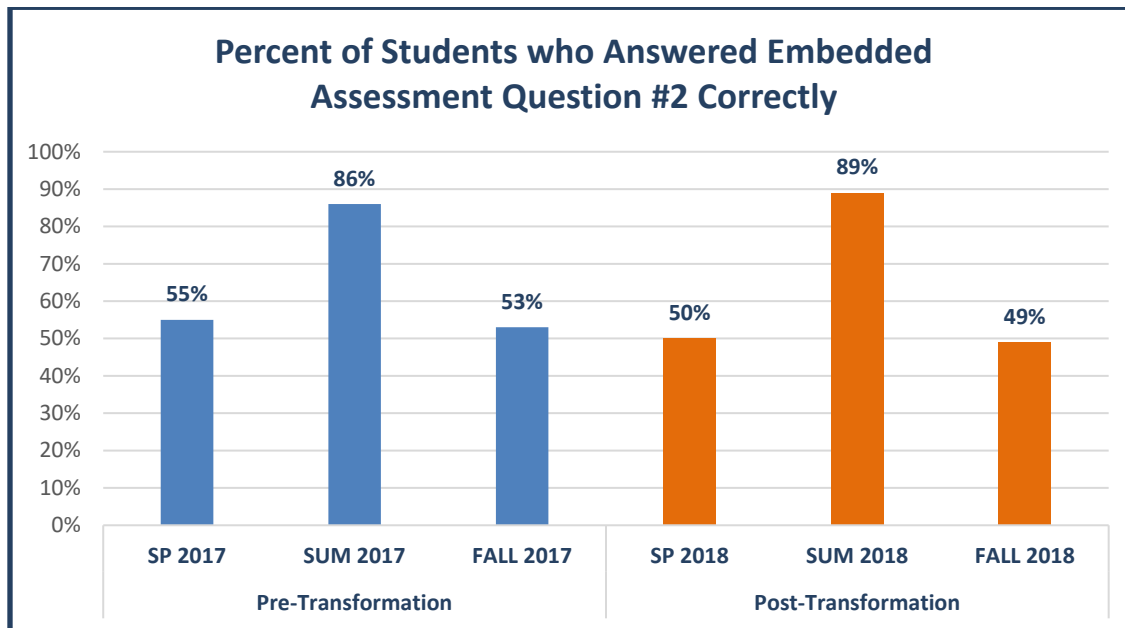


FIGURE 5. Percent of students who answered embedded assessment question #2 correctly.

As noted earlier, the impact of the OERs on the DFWI rates in BIOL 2107K and BIOL 2108K were also neutral. Over the course of the three semesters prior to transformation, DFWI rates in BIOL 2017K were statistically the same as the three semesters during the grant cycle (Figure 6). DFWI rates in BIOL 2108K demonstrated a similar trend however were less conclusive since there were no sections of BIOL 2018K offered in the fall of 2017 (Figure 7).

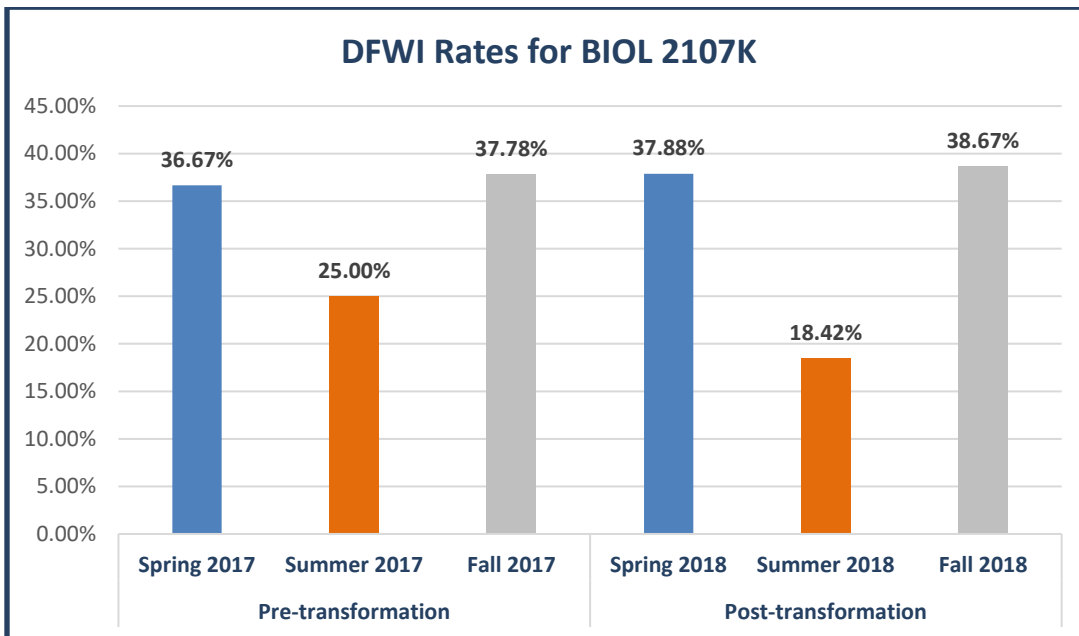


Figure 6. DFWI rates for BIOL 2107K during three pre- and post-transformation semesters.

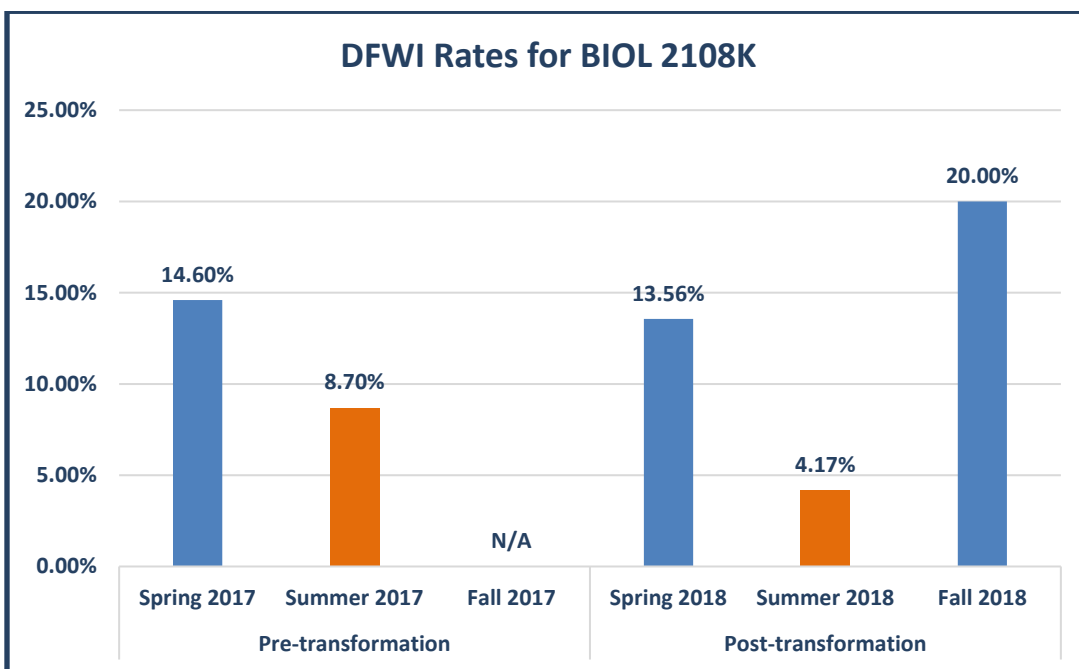


Figure 7. DFWI rates for BIOL 2108K during three pre- and post-transformation semesters.

4. Sustainability Plan

The Division of Natural Sciences and Physical Education at Georgia Highlands College is committed to using free or low-cost materials to support effective and affordable learning to students. Principles of Biology I (2107K) and II (2108K) will always be offered at GHC, as they are required for biology majors and numerous other science majors. Any course materials generated

by funding from this grant will be made freely available under the Creative Commons license for the public to access and use. Furthermore, all ancillary materials created for this grant were uploaded into the Principles of Biology LibGuide so that faculty and students outside GHC can access the materials and modify them as needed for their use. The LibGuide can be accessed at: <https://getlibraryhelp.highlands.edu/c.php?g=793681&p=5676401&preview=0dbb9f28bd154071d02d19e39802b88b>. At the conclusion of this grant cycle, all course materials will be also uploaded onto MERLOTII website and the Galileo Open Resource Materials website. Course materials will be reviewed annually, and any needed updates will be made. To ensure sustainability, links to online resources will be checked for availability and updated as needed. Team members will review and update all generated course materials in the master course templates three times a year (August, January, and May) to ensure they comply with the internationally recognized Quality Matters (QM) standards. This maintenance process is vitally important to ensure the most up-to-date and relevant materials are available to faculty and students.

5. Future Plans

Using the information collected from the surveys at the end of the semester, additional instructional materials will be created to address topics requested by students. Two team members and two other GHC faculty members have already been awarded an ALG Mini-grants in Round Twelve to facilitate the creation of additional ancillary materials such as closed-captioned videos for lecture and interactive-homework. Finally, we view the development of an online course format for Principles of Biology as a long-term commitment to the success of students at GHC and as such, all the materials created for this Large-Scale grant and the accompanying mini-grants were designed with that future usage in mind. Our goal is to have a full collection of materials available for sections BIOL 2107K and BIOL 2108K by Fall 2019.

6. Description of Photograph

In the photograph are two of our GHC biology instructors Lisa Branson (left) content expert and Kim Subacz (right) PI and content expert in the Marietta campus GHC biology classroom.

